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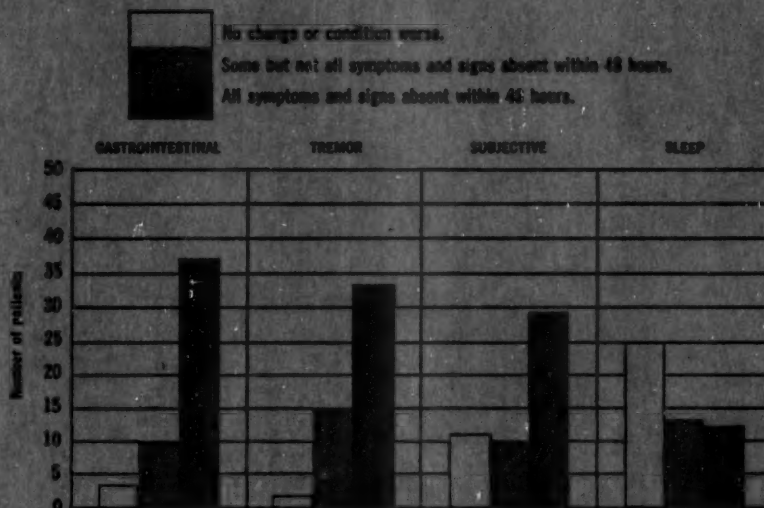
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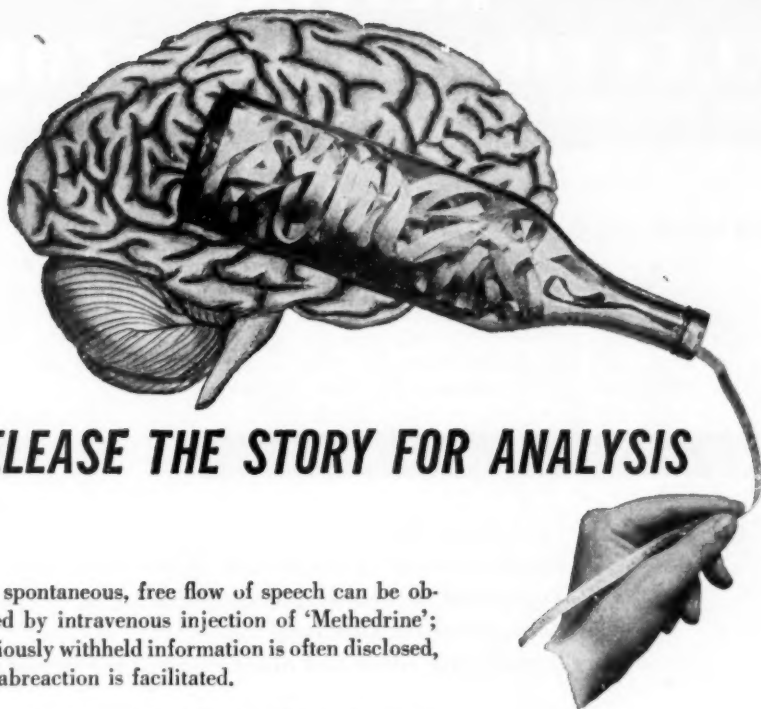
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 Shorvon, H. J., Rook, A. J. and Wilkinson, D. S.: Brit. M. J., 1300, Dec. 1950.

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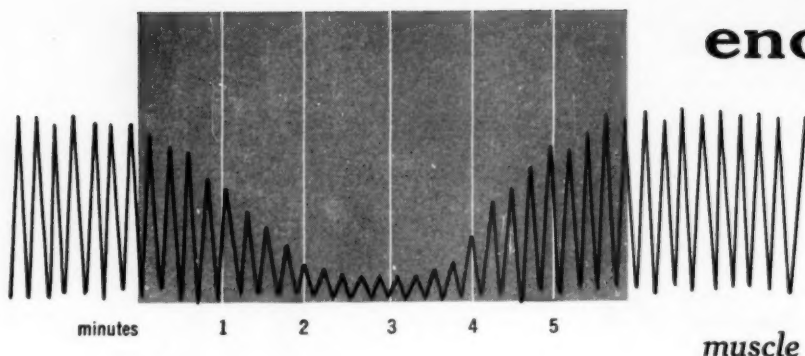
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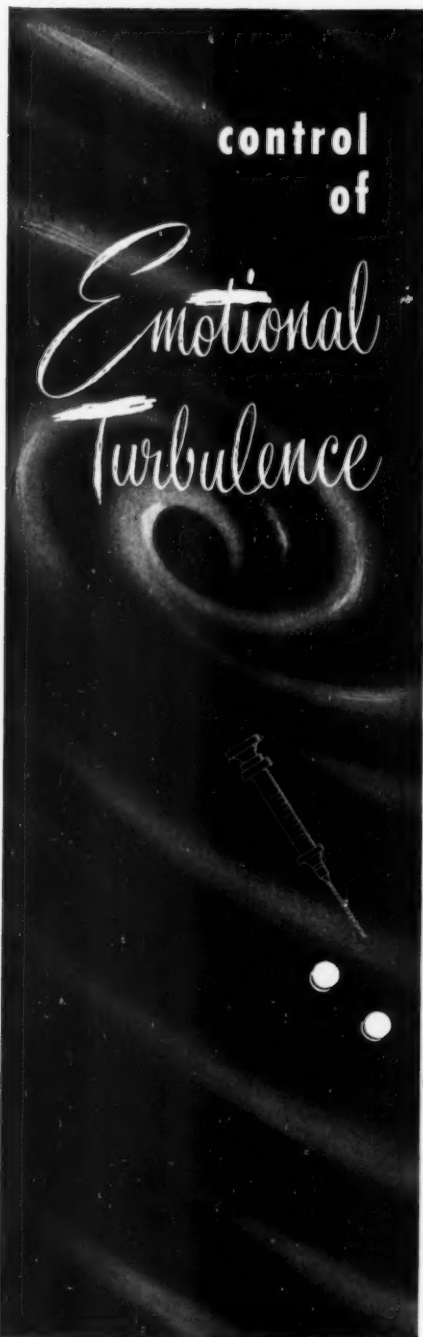
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THE RESPONSIBILITY OF THE PUBLIC MENTAL HOSPITALS IN PSYCHIATRIC RESEARCH¹

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The purpose of this communication is to discuss the role and responsibility of the public mental hospitals in advancing psychiatric knowledge through research. There are few among us who will doubt there is urgent need for new knowledge to help stem the ever-increasing tide of mental disease by other than construction of more housing for the care of patients.

Granted the need for an increase in knowledge, the question that immediately assumes importance is whether the complex subject matter of psychiatry can be formulated as a scientific discipline at the present stage in its development. If it can, then the methods of science that appear applicable and the role of the hospital in advancing psychiatric knowledge through the application of these methods may be indicated.

For roughly 30,000 years, ending about 3000 B.C., primitive man built his life around the use of stone. All his implements were fashioned from stone and so slow was his progress that neolithic man took 20,000 years to evolve from paleolithic man simply on the basis of learning somewhat refined methods of producing better implements—but still all from stone. The onset of what is called the "Metal Age" could not have been sudden and must have developed slowly as men learned to take from the ground and work its oil, coal, copper, iron, gold, and a host of other useful materials. It was, in point of time, only yesterday that science was born, leading to a most accelerated rise in knowledge and progress. The methods of science, cumbersome as they are, are the most potent devices yet developed by man to advance knowledge. It is these methods that have consistently transcended the most brilliant of man's philosophical efforts.

The physical sciences have developed the

most rapidly in their demonstration that all materials found on earth were combinations of a basic group of elements, that these elements could be combined in various ways creating entirely new materials, and that these elements were composed of more fundamental units, the secrets of which when unlocked would produce untold amounts of energy. Proceeding at a somewhat slower rate, probably because of the increasing complexity of the subject matter, but using the same methodological pattern, have come the biological sciences. Psychiatry, because of the breadth of its field, has followed, in part, the development of the biological sciences. But the area of psychiatry is so broad that it has depended equally upon the development of its own discipline and that of the social sciences including psychology. I cannot help being impressed with the concept of David Shakow that irrespective of the chronological ages of the various sciences, they have their own tempos of development just as do various species of animals. Maturation for different species may be reached at quite different periods depending upon the complexity of the species. On some such time scale then, what would take a month for physics would take a year for psychiatry, a year a decade and a decade a century. The slope of development of each science would then be different; those dealing with the more complex subject matter having a more gradual ascent. On this basis it appears reasonable to state that, whereas physics, chemistry, and the biological sciences have reached scientific adulthood, psychiatry is in the stage of adolescence. On this same time scale the social sciences could be considered to be still in their infancy.

The use of this analogy in the conceptualization of the maturation process for psychiatry would perhaps become clearer if the stage in the development of scientific psychiatry was briefly discussed. For any science the prodromal and first stages in its development are detailed qualitative descriptions of

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the phenomena in that field. This is called the naturalistic stage. From these observations working hypotheses may then be constructed. The second stage in the development of any science is the construction of methods that will allow the hypotheses to be defined in operational terms and then subjected to experimental verification. For this stage of development, experimental design begins to assume great importance. For now quantitative observations are desired with adequate identification and control of the operating variables. Studies such as these then lead to the verification or correction of the original hypotheses resulting from the first stage of the developing science. When enough observations have been made to confirm a hypothesis, then theory is born, which allows the formulation of laws of prediction.

Within this process of developing as a science, psychiatry can be thought of as being in its adolescent stage of maturation. To reach this conclusion we must consider that psychiatry has, or is on the verge of having, passed through the descriptive or naturalistic stage and is in the process of mobilizing and consolidating its strength for the next advance. This conclusion appears to be justified by considering the contributions that have led to present-day psychiatry. On the one hand, the great descriptive psychiatrists and their followers, Kraepelin, Bleuler, Meyer, have assembled naturalistic phenomena from which have developed nosological systems—concepts of disease and disorder. On the other hand, the method of psychoanalysis, springing from the genius of Freud, has added innumerable minute and detailed observations. These latter observations have led to the development of many hypotheses that lend themselves to a relatively consistent theoretical framework. Clinical psychiatric practice is dependent upon both the concepts of the descriptive and psychodynamic contributors. From the viewpoint of science, however, both streams of development, the descriptive and the psychodynamic, may be considered as description only; one relatively gross, a macrodescription, the other relatively detailed, a microdescription. The development of scientific psychiatry, then, through the contributions of these 2 streams of endeavor has accumulated the necessary

observations to lead to multiple hypotheses. From the viewpoint of psychiatry as a science, it would appear to have passed through the naturalistic stage and to be now poised for the next stage: the testing, correcting, and verifying of these formulations. If this is true, the question must then be asked, how can we and should we proceed.

During the time that psychiatry as a science has long been progressing through the naturalistic stage by accumulating detailed observations on patients, other scientific disciplines have followed their individual tempos of development. The physical and biological sciences are in maturity; the accumulation of knowledge, the testing of hypotheses, and the formulation of theories now result from experimentation. Although there has been some application of these methods to the problems of psychiatry, the rate of production has been all too limited. The biological methods of experimentation have been developed and the problems of psychiatry are present, so there could and should be an acceleration of collaboration between the biological scientists and psychiatrists. The limitation in such collaboration has been due to the failure of psychiatrists to woo the organic chemist, the biochemist, the pharmacologist, the physiologist, and others with the intriguing problems of psychiatry that are of mutual interest. Wherever this is done collaborative enterprise shortly follows.

Psychology, as another discipline, during the period of scientific development of psychiatry, has been slowly progressing from a different point of view. Not being under the continual responsibility for patient care and treatment as has psychiatry, psychology could more leisurely attend to developing experimental techniques for dealing with the complex problems of human behavior: methods designed for the control and study of the multiple variables that complicate research in psychiatry. It appears to me that these methods have developed or at least are approaching that point in their development where they may now be applied to the testing of the hypotheses that have come from clinical psychiatric study. The wedding of the methods of the psychologists to the subject matter of psychiatry has led to

the gestation of the area of experimental psychodynamics, which is experiencing the agonies of birth. As a matter of fact, there is a committee of psychiatrists, headed by my colleague, Dr. Paul E. Huston, which is concerned with a review of the literature and the formulation of principles for this area of study. It appears possible that the area of experimental psychodynamics will be rewarding for the collaborative enterprise of psychologists and psychiatrists. But again it appears probable that psychiatry must point up the problems and woo aggressively those in the other discipline.

The social sciences, still concerned with the descriptive phenomena of their area, are indebted to the contributions of psychiatry and particularly motivational psychodynamics for some of their progress. Although collaborative research between psychiatry and the social sciences must remain, for the present, at the descriptive level, the great areas of causation and prevention should stimulate the formulation of mutually satisfactory and rewarding projects.

From the above it would seem probable that present-day psychiatry is in a position to advance rapidly as a science through collaboration with other disciplines. Scientific psychiatry appears poised to enter the second or experimental phase of its development. To do this, however, it must move from the clinic to the laboratory.

For such an advance to occur, even though psychiatry is in a position to do so, 2 things must happen: one is the recognition of the need for research by psychiatrists in general; and the other is the readiness with which the public psychiatric hospitals will assume responsibility for support of research.

It appears to me that organized psychiatry does not view research as a necessity, but rather remains too satisfied within the present framework of knowledge, hypotheses, and theories. An examination of the active programs for education of the public in the principles of mental health seems to warrant this conclusion. These programs suggest to the uninitiated that all that has to be done is to allow psychiatry to apply its current knowledge, and treatment and prevention would be an accomplished fact. Justified, of course, are the public programs for de-

veloping new treatment facilities for both hospitalized and ambulatory patients. Justified, of course, are the programs aimed at changing the attitudes of the public so that they will become more understanding and sympathetic toward the emotionally ill. In contrast, one could ask the question whether the educational programs have, through any of the techniques of mass communication oriented toward parents, teachers, and all those who deal with the child, in any way reduced the incidence of psychiatric illness or led to improvement in personality development. Psychiatric propaganda all too frequently suggests this as true, while in the main ignoring the lack of and the need for new knowledge—new knowledge to be applied in the clinic and hospital for the treatment and care of the patient, new knowledge upon which to base preventive psychiatric programs.

In a recent article by Dr. Kubie published in *Science* entitled "Research in Psychiatry is Starving to Death," the point is emphasized that financial support for psychiatric research is inadequate and difficult to obtain. This is undoubtedly true. Whereas Kubie seems to believe that fund raising for research in psychiatry is related to some inherent difficulty in appeal of the subject matter, I am more inclined to believe it is due to negligence on our part to inform the public of our lack of knowledge and of our need for funds for research. Perhaps we would be wise to admit freely the limitations of our knowledge as do those who seek funds for research in other areas of medicine, as, for example, heart disease. It is difficult for the psychiatrist to say, "I don't know," for all too often a ready reply to an inquiry comes to his lips. If psychiatrists, then, can accept the need for research, perhaps the public will too, and adequate support will be forthcoming. One of the objectives of the Regional Research Conferences being cosponsored by The American Psychiatric Association is to impress the attending psychiatrists with the need for research. Unless psychiatrists as a group express these needs aggressively among themselves and to the public, progress will remain slow and feeble.

It appears to me that the public psychiatric hospitals must be willing to assume the

responsibility for research because of the nature of the research that is now needed. The public mental hospital is an ideal place to carry on these investigations. The basic plant is constructed and maintained and the patients are in residence. All that is needed are investigators, their assistants, and their equipment.

The present chronic mental hospital situation is somewhat reminiscent of medical education as it existed before the Flexner Report of 1910. Before then, teaching and medical practice were primarily in terms of dogma and empiricism. It was not until 1870 that any American medical school began to take an interest in research, which, as it gathered momentum, gradually improved instruction by leading to a system of selection of professors on a nation-wide, instead of a local, basis. Better training and the advancement of science through research were recognized as inseparable factors in medical education. The application of these contributions to the medical field has resulted in significant progress in the prevention of disease and the study and care of the sick. Of importance, then, to medical education was the enlistment of those skilled in the scientific method. Of equal importance to the improvement of our public mental hospital system would be the enlistment of those similarly skilled.

The public mental hospitals cannot depend upon the clinician and private practitioner to solve their problems. True, these latter may continue to make important clinical contributions. But the basic need now is for interdisciplinary research oriented toward both the testing of hypotheses and the inquiring into the causes and treatments of mental disease. It is the public mental hospitals that must assume the responsibility, as, for example, for the study of schizophrenia and for the study of the disorders and diseases associated with the aging process. I am certain that this is obvious to all of you. The public mental hospitals must also assume the responsibility for the study of all forms of therapy, including that of psychotherapy. The searchlight of study and investigation, if so directed, should ultimately shed light upon the common denominators that lead to 60% successful treatment irrespective

of the method used: orthodox psychoanalysis, modified psychodynamic psychotherapy, psychobiologic psychotherapy, or even carbon dioxide treatment. In the words of Dr. Leo Bartemeier in his presidential address to The American Psychiatric Association,

Psychotherapy as it is conceived and practiced today is the precocious child of psychoanalysis and psychiatry; it is the responsibility of these parents to prevent it from becoming an amateurish, free-for-all psychological indulgence, and to make it a disciplined, systematized branch of psychiatry. The responsibility for this task will have to be shouldered primarily by psychiatry; for psychoanalysis is after all a specialized method of treatment, a highly specialized one, and it is the psychoanalyst's job to train psychoanalysts.

If the public mental hospitals will assume the responsibility for research, they cannot help becoming progressive institutions. The function of our hospitals is not dependent upon the beauty of their architecture or the completeness of their appointments. Their function and their success are dependent upon the skill and capacity of the personnel. The addition to a hospital of a research group, if well integrated into the functioning of the entire unit, will go far to improve the caliber of the entire staff. This will occur not because investigators are superior individuals. In fact, their idiosyncrasies and their demands upon the administration may cause considerable distress at times.

The trained investigator is guided primarily by a spirit of inquiry. He desires to apply his techniques to questions of the how, the why, and the what. Imagination is and must be an important aspect of his functioning, but this is not free-floating phantasy but controlled and trained through the rigors of his discipline. He must remain relatively objective and not be affectively involved with the hypotheses and theories he wishes to put to test. His controlled enthusiasm will allow him to continue his tasks irrespective of whether he confirms or refutes the hypotheses he is testing. If these characteristics of the investigator are permitted to permeate the institution, an attitude of healthy skepticism will be maintained, a more tolerant attitude will develop, and a more scholarly approach to the problems of psychiatry will be voiced. If the research component of the institution is productive

and a scholarly attitude develops, dogma and empiricism and the authoritarian attitude will be challenged. The functioning of the hospital staff may become more democratic, enthusiastic, and active. Such functioning will have appeal: appeal to those students who wish to learn; appeal to those who wish to become scholars; appeal to those who wish to be associated with a progressive institution. The demand for personnel will reach far afield rather than remain at the local level. The institution will become dynamic rather than static and the caliber of the professional staff will be improved in all its component parts, from the staff physician, the nurse, the social worker to all the other ancillary personnel. In this way the status of the hospital will rise educationally and scientifically much as medical schools became the home for scholars and scientists earlier in the century.

The degree of optimism as to the impact of research upon the progress of an institution must be tempered by the reality of the situation. It is no easy task for the administrator to integrate a research program within the functioning of his institution, for it is the integration that is so important for the welfare of the entire unit. An isolated research unit, peripheral to the total functioning of the hospital, no matter how productive, will carry little of the desired influence or impact. Not only will the hospital not benefit but the stabilizing influence on the thinking of the research worker, who is in contact with the everyday problems of the hospital, will be lost. With so few trained investigators in psychiatry, it is tragic to witness their isolation in certain hospital settings. The potentiality for those institutions has not been reached—either in education or in science.

It is not easy to organize a hospital so that research becomes a major interest and function. Within the time limits available, we cannot discuss the innumerable problems of hospital organization for research. Let me refer instead to the excellent chapter on this subject in Dr. William Bryan's book, *Administrative Psychiatry*. Rather I wish to limit my remarks to several points that I consider need emphasis if a research orientation for the institution is to be obtained and maintained.

First, I would like to comment on the role of the administrator or superintendent. Unless he is convinced, as was Dr. Bryan, of both the romance and need for research, an active unit will never develop. Although the administrator need not be trained as an investigator, unless he is convinced of the necessity for research, he will be unable to accept either his responsibilities for the development and maintenance of the research unit, sometimes to the detriment of other divisions of his hospital, or the innumerable irritations that a research unit will bring. He must maintain interest, enthusiasm, patience, and understanding if this endeavor is to succeed. It is his responsibility, in part at least, for the obtaining and budgeting of funds as well as arranging for space and equipment. It is his responsibility to select the personnel and to determine their status in the total organization. The integration of the research unit in the hospital becomes his responsibility. He must remain aware that research proceeds slowly, that his investigators need plenty of time whether they have other duties or not. He should not expect, if there are part-time investigators, that other responsibilities like that of service take precedence. He should insist that the aims and goals of the research are clearly stated and adhered to. And lastly, he should attempt to protect his research personnel from the vicious encroachment on their time by "red tape" such as the questionnaires and reports that seem to be so intimate a part of our present-day culture.

The role of the administrator is of tremendous importance in the development of a research unit. Almost of equal importance is the need for funds. Research is extremely expensive and cannot be conducted on a "shoestring." In the past, funds allocated for research by our various states have been negligible—many states having no such allocation of funds at all. The voluntary health agencies spent per disability for research from a high of \$3.49 for cancer to a low of $\frac{1}{2}$ cent for mental health. The total spent by the nation from all sources, governmental and private, for research on mental disease was \$4.15 per mental patient under treatment. In contrast, \$28.20, \$27.70, and \$26.80 were spent per patient for infantile paralysis, cancer, and tuberculosis, respectively. This

is in considerable contrast to many industries that spend between 3% and 4% of their gross income on research. There is a ray of hope, however, on the financial horizon for mental health research. The Council of State Governments has as one of its primary projects the study of the mental health research resources and needs of the 48 states. Included in this study is the amount of support for research and the results being obtained to date. It is most probable that as a result of these studies recommendations for increased allocation of funds for psychiatric research will be made. It behooves us to develop our plans to exploit these recommendations and then to utilize the funds efficiently in support of the hospital research programs.

One sometimes hears the statement that additional funds are not needed; that the funds now available are being wasted by the investigation of "poor" ideas. This statement needs to be challenged. It is extremely difficult to evaluate an idea, and particularly if it is counter to tradition. The history of science has repeatedly shown that major advances in knowledge and theory have resulted from the investigation of ideas that were not, at the time, considered "good." Rather than criticizing ideas and problems for study, it would be legitimate to criticize the experimental methods being used. Too often the experimental design is inadequate and amateurish. The complex subject matter of psychiatry demands the most sophisticated of research methods. The Regional Research Conferences sponsored by The American Psychiatric Association will have succeeded if they do nothing more than lead to improvement in the methods being used. Currently funds are wasted, not on poor ideas, but on poor experiments due to inadequate design.

With forward-looking administrators and funds probably becoming available, a real "bottle-neck" is still present. It consists in the extreme shortage of trained personnel. We are in short supply of psychiatrists disciplined in the philosophy of science and experienced with the techniques of experimental design. We cannot delegate any more than collaborative responsibility to investigators from other disciplines, be they bio-

logic, as biochemists or physiologists; or be they social scientists, as psychologists or sociologists. We as psychiatrists must assume the responsibility for psychiatric research. It is we who should be responsible, owing to our training, for the designation of the problems and the goals of our projects. We are in need of a program for the training of psychiatrists in the principles and methods of investigation. One step for eventually increasing the ranks of investigators is that being taken by the Committee on Research of The American Psychiatric Association, which hopes to stimulate this training for more psychiatrists during their residency period. However, investigators will always remain too few unless at least 2 changes from our present functioning occur: One is that there be an elevation of the cultural status role of the investigator to an approximate equality with the successful clinician. This may occur when psychiatrists as a group are willing to express both the limitations of their knowledge and the need for increase in knowledge; when administrators are actively and enthusiastically supporting research in their institutions; and when investigators are no longer isolated but integrated into the total functioning of the hospital. Secondly, if the need for more psychiatric investigators is justified, their financial remuneration must become commensurate with clinical practice. One frequently hears the statement that the major research productivity of an individual occurs during the early part of his career. That this is true is in part due to the shift of his interests and responsibilities as he grows older. It is then that the investigator's family enlarges and his financial obligations increase. To meet these additional responsibilities, all too often it is necessary for him to seek increased financial remuneration. This may most easily be obtained by turning to administration or clinical practice with concomitant sacrifice of research interests and activities. Each investigator who gives up his research activity reduces the total available of such experience and skill. The numbers are too few for psychiatry to allow this to continue.

To conclude, let me briefly summarize my thesis. Psychiatry, owing to the intense

application of the clinical method, has passed through the naturalistic stage of its development as a science and is now poised to enter the second stage through the application of the experimental method. For this to occur, active collaboration with scientists in other disciplines is imperative. Psychiatrists in general must recognize and express both the limitations in current knowledge and the need for new knowledge through research. It is in the great public mental hospitals that

the major share of research activity must now take place. The integration of research into the total function of an institution will increase its educational and scientific prestige. The impetus for an increase in research in hospitals depends largely upon the responsibility that administrators are willing to assume. They are the keystone of the arch, funds constitute the mortar and stone, while the personnel fit the mortar and stone together.

NEUROPATHOLOGIC LESIONS FOLLOWING LOBOTOMY¹

A STUDY OF FIFTEEN CASES OF BILATERAL PREFRONTAL LOBOTOMY

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Since the introduction of lobotomy many thousands of psychotic patients have been operated on for the alleviation of their symptoms. The mortality is reported 1% by Poppen(1) and 3-6% in recent cases and 8-10% in chronic cases by Worthing(2). Neuro-anatomic and neuropathologic studies have been reported by Yakovlev(3), Meyer(4, 5), Freeman(6-8). The aim of the bilateral prefrontal lobotomy is to cut the frontothalamic fibers on both sides to achieve relief of emotional symptoms without undermining the patient's personality too much, for it has become evident that many lobotomized patients lose intellectually. The intellectual deficit may be slight or incapacitating, and there are no ways of predicting the outcome, although much thought has been given to the methods that might forecast it.

The purpose of this paper is to report in greater detail macroscopic and microscopic findings in bilateral frontal lobotomy in an attempt to evaluate the process of repair of the lobotomy wound, its extent, and the factors that may adversely affect it. Our material consists of 15 brains of lobotomized patients, 8 women and 7 men. The interval between the lobotomy and death was from 11 days to 5 years and 4 months. The interval between the patient's admission to the hospital and the date of operation was 5 to 40 years. The operations were performed in 5 different hospitals by 6 neurosurgeons. Most of the patients were operated by the Lyerly-Poppen method. Two brains were cut sagittally, 6 horizontally, and 7 coronally. Hematoxylin and eosin, cresyl-violet, Van-Gieson,

Mallory's PTAH, Hortega, Masson, Bodian, Loyez, iron and fat stains were used.

FINDINGS

CASE 1.—N. G. Diagnosis, manic-depressive psychosis, stuporous type. This female patient was admitted at the age of 32 because of severe depression and an attempted suicide. She was depressed, had to be tube-fed, later became noisy, overtalkative, overactive, profane, and destructive.

Physical examination negative. Blood pressure 102/62. Prelobotomy laboratory examination negative. X-ray of skull: no direct or indirect evidence of intracranial pathology. Metrazol was tried without benefit. Patient deteriorated and after 20 years of hospital residence lobotomy was performed by Lyerly-Poppen method. Two weeks after the operation she developed fever, Kernig's sign, stiffness of the neck, rigidity, increasing apathy. She died at the age of 52, 74 days after lobotomy. (See Fig. 1.)

Autopsy Findings.—Purulent meningitis. Subdural hematoma, right and left hemisphere. Osteoma—inner table of right frontal bone; cerebral atrophy. Lobotomy incisions. Septic granuloma at the site of the surgical defect on the left. Head: skull was asymmetrical. Two symmetrical burr-holes in the frontal bone. Dura mater was adherent to the skull at the site of the burr-holes, otherwise stripped off easily. Dura was thin and its inner surface was colored deep-reddish brown over both hemispheres, especially over the left. Superior longitudinal sinus had a pinkish-red organized clot 5 cms. long. Pia-arachnoid was clear and transparent over the upper surface of the brain but easily torn. Weight of the brain—1210 gms. Brain was atrophic. There was a noticeable widening of the sulci, which were filled with a large amount of pale yellowish subarachnoid fluid. In the right frontal lobe there was a round, punched-out area measuring 1.2 x 1.0 cm., located in the R.F. 1, at the distance of 6.5 cms. from the right frontal pole and 4.8 cms. from the Rolandic fissure. In the L.F. 2 there was an area approximately of the width of the gyrus, but much paler and softer than the rest of the gyri. The vessels of the base and the cranial nerves presented nothing of note. The lower and upper surfaces of the cerebellum were covered with a thick layer of thick yellow pus coming from under the splenium of the corpus callosum. Sections showed enlarged ventricles and a large encapsulated abscess in the right frontal lobe.

Microscopical Findings.—The meninges were thickened and infiltrated with polymorphonuclear

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leucocytes, lymphocytes, and plasma cells. Many pial vessels were thrombosed. Ependymitis was present. The thalami were atrophic. The loss of cells and gliosis were most noticeable in the left anteroventral and in both mediadorsal nuclei. In the hypothalamus increased congestion but no pathological changes in the cells of the hypothalamic nuclei. The irregular areas of necrosis extended down to the orbital plate of the cortex, and an encapsulated abscess was present in the frontal lobe. The sections containing the surgical lesions stained showed necrosis of the cortex leading into the abscess, surrounded by congested dilated capillaries, dilated and thrombosed arterioles, accumulations of pus-cells at the distance from the necrotic area. The line of surgical tract was outlined by a ribbon of innumerable gitter-cells filled with debris and lipids. The movement of these cells can be followed along the perivascular spaces of the vessels, into the subarachnoid spaces. There was no evidence of connective tissue fibers or fibrillary astrocytes. Conclusion: Acute bacterial infection with evidence of destruction of the nerve tissue and the transportation of debris into the subarachnoid space. No evidence of healing.

CASE 2.—A. G. This schizophrenic male patient was admitted at the age of 24 because of change of personality, delusions of sexual nature, hallucinations, and inability to get along. Physical examination was negative. X-ray of skull was negative. Insulin therapy was given without benefit. Bilateral frontal lobotomy was performed by Lyster-Poppen method after 12 years of hospital residence. Patient had a long, febrile postoperative course. Three months after the operation, he developed fever, weakness, and rigidity. A surgical exploration was done. No pus was found, but there was a small amount of degenerating brain and accumulation of fluid, more marked on the right side. He died 4 days after the second operation and 128 days after the first.

Autopsy Findings.—Bilateral lobotomy. Blood clots in the burr-holes; subdural hematoma organized above and around the left operative field; postoperative cerebral edema; cerebral anemia and soft orbital surfaces of the frontal lobes, especially on the right; pulmonary edema; pulmonary infarction. Two parallel incisions of the scalp running from the hair line backwards over the frontal region were closed with horsehair sutures. There was a soft swelling around the left incision and clear fluid was escaping drop by drop from it. The scalp was edematous. Dura mater was adherent to the burr-holes. Dural sinuses were negative. Pia-arachnoid was transparent. The superficial veins were engorged. Brain weight—1220 gms. It was small, pale, and edematous with diffuse cortical atrophy and dilated ventricles. Pial arteries, basilar artery, and both vertebral arteries were filled with dark-red firm clots. Dura mater showed organized subdural hematoma.

Microscopic Findings.—The pia-arachnoid was thickened and infiltrated with lymphocytes, polynuclears, and plasma cells. There was an infarction of both thalami and of the pons due to basal men-

ingitis and septic thrombosis of the thalamic branches of the posterior cerebral and of the basilar artery. The sections of the surgical lesions, area 9, showed several cysts, one communicating directly with the surgical tract, others situated close by in the subcortical matter. The cysts were lined with shaggy fragmented tissue consisting mostly of vessels and wide ribbons of gitter-cells filled with lipids. The capillaries were greatly distended with blood and many small arteries and arterioles were filled with blood clots. The cell lamination in the immediate vicinity of these cysts was disturbed and the destructive disappearance of cells was striking. Even at the distance from the cysts, the neurophagia was striking. In the whole-brain sections stained with the Loyez method, the loss of myelin in the vicinity of the cysts and edema of the white matter throughout the brain were very noticeable. There was no evidence of repair.

CASE 3.—G. B. Diagnosis, manic-depressive psychosis. This 40-year-old woman was admitted because of depression, somatic complaints, hallucinations, fears of being killed, and sudden periods of excitement. Physical examination was negative, except for moderate hypertension—140/90. Hinton negative. X-ray showed an osteoma of the greater wings of the left sphenoid just above and anterior to the pituitary body. During her 5-year stay in the hospital she was in a state of continuous excitement. Two series of electric shock treatments were given without benefit.

Lobotomy was performed after 8 years of hospital residence. Five days after the operation she began to run a high temperature; 5 days later she showed a right hemiplegia, aphasia, epileptiform movements of the right arm and leg. A second exploration was done 2 weeks after the first; no pathology was noted. Right hemiplegia and aphasia continued. She had to be spoon-fed. She died 100 days after the first operation.

Cause of Death.—Bronchopneumonia and meningitis. Permission for the head only was given. There were two burr-holes in the frontal bone. Dura mater was firmly adherent to the brain in the fields of surgical defects. Brain weight—1210 gms., very soft and flabby, especially in the left pre- and postcentral convolutions. Sections showed the surgical tracts in the white matter of both frontal lobes and in the roof of the left lateral ventricle. Left surgical tract had formed communication of the field of operation with the left lateral ventricle. The tracts were wide, especially on the left, showing extensive necrosis of the white matter and ependyma, with pronounced brown coloring of these tissues. The cerebrospinal fluid was escaping through this channel and the cerebral tissue of the frontal lobe was thoroughly macerated. Lateral ventricles dilated. Both heads of caudate nuclei showed large areas of necrosis. Microscopic examination: Granulation tissue in the center of the left surgical wound interspersed with gitter-cells. Numerous hypertrophied astrocytes in the edematous cerebral tissue peripheral to the wound. At the point of adherence of the dura to the brain, numerous gitter-cells and hypertrophied astrocytes.

Cortex showed diffuse loss of nerve cells and myelin.

CASE 4.—E. H. Diagnosis, manic-depressive, manic. This housewife was admitted first at the age of 40. She was treated with hydrotherapy, metrazol, and 2 series of electric shock treatment with temporary improvement only. Lobotomy was done after 20 years of hospital residence.

Coagulation-aspiration method was used. Cortex appeared atrophic. Biopsy was taken from both hemispheres. A cystic dilatation was encountered on the left side. Two days after the operation, left hemiparesis and left facial weakness were noted. Two weeks after the lobotomy she was re-explored with essentially negative findings. Several lumbar punctures were done. Cerebrospinal fluid examination revealed high protein, from 166-317 mg.%, and a large number of red and white cells. Culture of the purulent fluid from the operative wound showed staphylococcus aureus. Ventriculogram revealed marked ventricular dilatation, and re-exploration of the lobotomy wound with debridement of infected wound and left frontal lobectomy were done. This patient had a long postoperative course complicated with meningitis that required several interventions after the first operation was performed. Patient died 31 days after lobotomy, and 5 days after lobectomy.

Anatomical Findings.—Necrosis of the brain. Subdural hemorrhage. Lobotomy and left frontal lobectomy. Brain weight—1200 gms. The left frontal lobe had been removed and the edges of the lobectomy were rough and slightly yellowish. The base of the brain had the same slightly yellowish appearance. No visible exudate over the surface of the base of the brain. Thin layer of clotted blood under the dura and under the frontal lobes. The right lobotomy wound appeared to be healing. The meningeal vessels were markedly dilated with blood.

Microscopical Picture.—Rarefied edematous brain tissue with dilated vessels, many of which contained partially or fully organized blood clots. Some of the vessels were surrounded by ring hemorrhages. Loss of cortical nerve cells and myelin.

CASE 5.—W. F. Diagnosis, schizophrenia. He had no previous shock treatment. Because of his greatly disturbed condition, prefrontal lobotomy was performed at the age of 46 years. Coagulation-aspiration method was used. The patient developed fever and incontinence 6 days later. The wound was reopened and cleaned. The cerebrospinal fluid contained polynuclear leucocytes and a number of iron-containing phagocytes. The protein was 400 mg.%. The patient was treated with sulfadiazine and penicillin and the infection cleared up. However, he developed bronchopneumonia and died 39 days after the first operation.

Cause of Death.—Bronchopneumonia, hemorrhagic infarction of lungs, massive pulmonary embolism, thrombosis of the left femoral vein. Head: Burr-holes of the skull, recent lobotomy wounds with a slight brownish discoloration of dura. Brain weight—1650 gms. Sections of the brain showed hemorrhagic and edematous areas through the white

matter into the frontal horns of the lateral ventricles and extending across the heads of both caudate nuclei.

Microscopical Examination.—Much necrotic edematous tissue with numerous polynuclear leucocytes, lymphocytes, and large phagocytes, many of which contained fat, hemosiderin, and hematoidin; proliferation of blood vessels in the vicinity of necrosis, marked gliosis, astrocytosis, and fibroblastic proliferations as well as a blood clot with fibrin formation in the wound tract. (See Figs. 2, 3.)

CASE 6.—C. C. Diagnosis, without psychosis, intractable pain due to carcinoma of the mouth. He was given x-ray treatment, which was followed by radio-necrosis of the mandible. Severe pain ensued and a retrogasserian neurectomy was done with temporary relief. His left carotid artery was ligated because of hemorrhage. The severe pain continued and prefrontal lobotomy was done to relieve it. The operation was followed by considerable apathy and relief from the pain, the patient stating that the pain was present but "did not bother him" any more. On the day of his death, he suddenly developed respiratory difficulty, cyanosis, weak pulse and died 42 days after the operation.

Autopsy Findings.—Epidermoid carcinoma of tongue and mouth, operated and irradiated. Massive ulceration of tongue and mouth, following irradiation. Asphyxia due to aspiration of food. Prefrontal lobotomy. Retrogasserian neurectomy. Radiation reaction of skin and structures of left side of neck.

Head.—In the frontal bone on each side of the midline was a surgical defect consisting of a circle of bone 2.5 cms. in diameter that had been removed and replaced. These plugs of bone were held firmly in place by fibrous tissue. There was no bony union. The underlying dura was adherent to these operative defects and there was a scar in the dura on each side. The scar on the left was well healed, while that on the right was largely open and contained a dark-red thrombus. The brain was edematous. Dura mater on both sides of the superior longitudinal sinus was adherent to the pia-arachnoid by short, white, firm adhesions. The superior longitudinal sinus contained no blood clot. All the superficial vessels were engorged and stood out prominently. (See Fig. 4.)

Microscopical Examination.—The whole-brain sections stained with Loyez show destruction of the white matter of the LF 2, LF 3, irregular area of demyelination of the corpus callosum, left internal capsule and destruction of the lateral half of the left thalamus, also of the white matter of the RF 1, and of the right centrum ovale. Slides stained with H & E showed a large number of gitter cells along the surgical tract, which was almost completely filled out with a large blood clot. There were many vessels with widened, thickened walls, some dilated and filled with blood, some clotted. Necrosis and edema of the brain on each side of the tract were present. Numerous large macrophages filled with dark-brown substance (in H & E) and glial nuclei were present. From the main surgical tract under different angles ran short, narrow, straight areas of

necrosis of the same structure—gitter cells and glial nuclei. The brain tissue intervening between these areas of destruction was greatly edematous and devoid of brain cells. Some of the arterioles distant from the surgical field showed great proliferation of endothelial cells, narrowing their lumens and a large number of fat-laden macrophages. The iron stain showed a lesser number of macrophages filled with hemosiderin. (See Figs. 5, 6.)

CASE 7.—W. O. B. Diagnosis, schizophrenia. After 9 years of hospital residence, lobotomy was performed. He had an uneventful recovery. No drugs were used after lobotomy. Postoperative treatment consisted of psychotherapy and occupational therapy. On the 87th postoperative day he had 2 epileptic seizures in quick succession and died in status epilepticus. (See Fig. 7.)

Autopsy.—Slight hyperemia of meninges and of the brain and a slight broadening of the gyri. The left orbital surface was softer to touch than the right. The weight of the brain was 1,480 gms. Right surgical field had formed a funnel-shaped defect in the brain. From the bottom of this funnel a cut 2.8 cms. long extends through the white matter horizontally into the gray matter of the RF2. Another cut in front of the frontal horn reaches the U fibers of the supracallosal gyrus. On the left the operative defect is almost identically placed in the LF 2. The surgical track extends down, tunnels through the white matter of the LF 2, almost to the orbital surface in front and laterally to the left frontal horn.

Microscopical Examination.—Active healing process with proliferative and destructive changes side-by-side. On each side of the operative track there was a large number of widely spaced, large astrocytes in edematous cerebral tissue. Nearer the wound track, these cells were much closer to each other, forming a sort of ribbon on each side of the track consisting of astrocytic bodies and loose wavy glial fibers. This "ribbon" was sharply demarcated from a wide collection of gitter-cells, lymphocytes, and vessels. These large gitter-cells were filled with pigment taking yellowish-brown color in H & B stain and giving a positive reaction for hemosiderin.

CASE 8.—W. S. Patient had numerous episodes of depression and agitation. Two courses of electric shock treatment failed to bring about an improvement. Because of his continuous agitation, bilateral frontal lobotomy was performed at the age of 75. Coagulation-aspiration anterior to the frontal horns of the lateral ventricles was used. The postoperative recovery was slow, the patient afebrile, but lethargic and incontinent and had to be tube-fed. He showed no mental improvement. The patient died 120 days after the lobotomy. The cause of death was aspiration of food, coronary sclerosis, and large lobotomy lesions in both frontal lobes. Head showed burr-holes in the frontal bone of the skull, corresponding holes in the dura with discoloration, holes in both frontal lobes near the midline. Horizontal sections showed large cavities in

the white matter of the frontal lobes reaching nearly to the anterior wall of the lateral ventricles. The arteries of the base were sclerotic.

Microscopical Examination.—Numerous senile plaques in the frontal lobes. The surgical defect consisted of a cystic cavity with new-formed capillaries, gliotic fibrils, numerous fat-laden and some iron-containing histiocytes; and also numerous fat-containing phagocytes and a dense gliotic tissue in adjacent areas at the distance from the surgical fields. The arterioles in the neighborhood and the proliferated capillaries showed thickened walls and hyaline appearance. On the left the scar consisted of a delicate, widespread connective tissue in the meshes of which were found numerous large, loose gitter-cells. On the right, spears of glial tissue containing large glia-cells with long fibrils interspersed with large, round gitter-cells.

CASE 9.—M. E. Manic-depressive, female patient. No prior convulsive therapy. Lobotomy was performed after 8 years of hospital residence, at the age of 44. The coagulation-suction technique was used. Patient had an uneventful postoperative course until she suddenly developed abdominal pain and rigidity. Laparotomy revealed bilateral pyosalpingitis with rupture of the right tube. Total hysterectomy was performed. Despite intensive antibiotic therapy, she died 2 days after the operation and 11 days after the lobotomy.

Permission for the head only was given. Cause of death: Acute peritonitis, bilateral salpingitis. The brain was very small and soft, weighed 1050 gms. Calcification of the falx cerebri and numerous symmetrical ray-like calcifications on each side of the falx cerebri parallel with the superficial veins were noticed. Dural sinuses were negative, pia-arachnoid thin and transparent. There were 2 round surgical defects filled with clean pink granulation tissue in both frontal lobes. Sections showed atrophic cortical plate. Lateral ventricles were not enlarged. Large area of softening extended across the anterior end of the basal ganglia destroying on the right the head of the caudate nucleus, the anterior half of the anterior limb of the interior capsule, the tip of the putamen, and extending into the white matter of the RF 3, external capsule and anterior end of the Island of Reil. The lesion measured 3.5 x 2 cm. at its longest diameter. It came close to, but did not break through, the ependyma. The lesion on the left destroyed the head of the caudate nucleus, the anterior half of the anterior limb of the internal capsule, external capsule, and the anterior end of the Island of Reil. The ependyma of the left lateral ventricle was necrotic. Right lesion was deeper than the left and extended down to the orbital surface appearing as a small, round, necrotic lesion in the posterior end of the right rectus convolution.

Microscopical Examination.—H & E stain. In the field of operation a network of dark-blue, wide spread fibers (scattered masses of gelfoam) were seen. The areas of laked blood, numerous blue fibers of gelfoam with wide interstices filled with coagulated blood, eosinophilic homogeneous ma-

terial, connective tissue fibers, a large number of polynuclear and a moderate number of endothelial cells, and an occasional lymphocyte were present. At the point where the gelfoam came close to the dura there was a group of large multi-nucleated cells. The fibrous tissue of meninges was increased, forming thick, parallel, wavy bundles, and greatly cellular, somewhat spongy, connective tissue fibers were also present. The brain tissue on each side of the surgical tract was edematous and contained a fair number of polynuclear leucocytes. The vessels were filled with blood and here and there small fresh ring hemorrhages could be seen. Small groups of gitter cells were scattered in the white matter at the distance from the surgical tract. Section through the operation field showed a wide layer of round cells, lymphocytes, plasma cells, mononuclear cells and, to a lesser degree, polynuclear leucocytes and around it a wide band of gitter-cells and numerous newly-formed vessels. The brain tissue outside the surgical tract had numerous dilated vessels, often with hyalinized walls and round cell infiltration of Virchow-Robin's spaces. Mixed in were large glial cells and young fibroblasts. Large-bodied, pale-pink astrocytes were seen in large numbers just outside of the surgical tract. This young granulation tissue stained with Sudan 3 showed innumerable macrophages filled with fat. Iron stain showed very few blue masses in the ground tissue.

CASE 10.—E. N. This male schizophrenic patient received 10 metrazol treatments without benefit. Lobotomy was performed after 25 years of hospital residence. Postoperatively, his temperature rose to 103 degrees. Lumbar puncture was done, the pressure was 300, lowered to 170, after which the patient made an uneventful recovery. Mentally he was only moderately improved. Several weeks after lobotomy he developed brawny edema of both legs up to the knees, which was attributed to the operation. Three and a half months after lobotomy he had sudden hyperpyrexia, complained of lumbocostal angle pain and tenderness. His urine showed numerous red and white cells, N.P.N. was 160 mgs. He died 113 days after lobotomy.

Autopsy Findings.—Septicemia, uremia, and acute ascending cystitis-pyelonephritis. Head: Brain was greatly edematous. Horizontal sections: On the left side, the operation track started at the foot of the LF 3, curved across the white matter slightly forward and upward toward the tip of the left frontal horn, stopping abruptly at the ependyma, without penetrating the ventricle. On the right, the section started at the foot of RF 3 and extended horizontally, cutting through the upper gyrus of the insula, external capsule, claustrum, internal capsule, and the head of the caudate body opening into the lateral ventricle, ending in a cystic dilatation of the tip of the frontal horn. There were several areas of cystic necrosis, in the corpus callosum, in the white matter of both frontal lobes, especially the left, in the right head of caudate nucleus and the anterior end of both internal capsules.

Microscopical Examination.—Fat stain showed no necrotic, fat-containing debris in the central portion, which had formed a cystic cavity partly filled

by spear-like strands of connective tissue growing from the periphery of the cyst toward its center. The spears of the connective tissue contain no fat, but at their wide peripheral base they contain a large number of fat-laden phagocytes.

CASE 11.—H. M. Female schizophrenic, a patient in different state hospitals since the age of 33. She had carcinoma of the breast and multiple metastases to bone, lymph nodes, and liver, and to relieve an intractable pain prefrontal bilateral lobotomy was performed after 21 years of hospital residence. She developed hyperpyrexia, 107, four days later. Cerebrospinal fluid contained 2200 red cells, 400 mgs. protein, and a large number of polymorphs and phagocytes containing hemosiderin. She was treated with penicillin, the wound was reopened and cleaned. She died 11 days after lobotomy.

Cause of Death.—Carcinoma of the breast with multiple metastases to ribs, bones, liver, lungs, and adrenals. Head: Burr-holes in skull, similar holes in the dura, subdural hemorrhage, holes in the frontal lobes. Moderate arteriosclerosis of the cerebral vessels. Horizontal sections showed wound tracts through the white matter of frontal lobes with edema and hemorrhages distant to the wound tracts involving also the caudate nuclei.

Microscopical Examination.—Fresh hemorrhages, necrosis, and edema of the surgical field, also numerous fat-laden phagocytes, a few iron-containing phagocytes, proliferated vessels with gliotic fibrils, arterioles and capillaries surrounded by edema, red cells and inflammatory cells, lymphs and polys. Nerve-cells had disappeared from the edematous areas of the caudate nucleus, and the adjacent cortex of frontal lobes near the wound tract showed signs of disintegration. Similar changes in different parts of the frontal lobe at the distance from the surgical area.

CASE 12.—M. K. Female manic-depressive. The patient was admitted at the age of 51. Bilateral prefrontal lobotomy for intractable pain due to carcinoma of the breast was done after 12 years of hospital residence. The ventricles were entered on both sides and revealed a moderate hydrocephalus. There was some rise of temperature and the patient was given penicillin. She died 27 days later. Head: Lobotomy wounds and subdural small hemorrhages.

Microscopical Examination.—Tissues near the wound tract contain numerous fat- and iron-containing phagocytes; large necrotic area involved the caudate nuclei, had fresh hemorrhages, numerous vacuoles, cellular infiltrates, lymphocytes, and some polys and numerous phagocytes. There was proliferation of the capillaries in the neighborhood of the necrotic area. The edematous necrotic area was demarcated by fibrotic and gliotic tissue.

CASE 13.—L. H. Female, involutional melancholia. This 57-year-old female factory worker was admitted because of depression and agitation. She was treated with hydrotherapy and electric shock, with only temporary improvement. Lobotomy was done after 11 years of hospital residence at the age

of 68. Patient quieted down. Five years and 4 months later patient had cerebral thrombosis and died of aspiration pneumonia at the age of 73. (See Fig. 8.)

Autopsy Findings.—Head: Scalp was lightly adherent to the site of lobotomy. The dura was thickened. There was a depression and yellowish fluid in the defect made by the lobotomy, which appeared well healed. The right cerebellar lobe, the peduncle, and the adjacent portion of the occipital lobe were necrotic. Sections through the basal ganglia showed many old tiny softenings in the thalamus, putamen, and globus pallidus. All the arteries were enlarged, tortuous, and calcified. Right porencephaly.

Microscopical Examination.—Thickening of the pia-arachnoid. Dilated congested pial vessels. Congested cortical and subcortical vessels. Cystic formation in the white matter of both frontal lobes, outlined by the wall of connective tissue fibers. Peripherally to the wall, there were numerous macrophages filled with lipid.

CASE 14.—F. B. Female, schizo-affective. Electric shock treatment was given without benefit and 3 years later lobotomy was performed at the age of 56. She had difficulty in controlling her bladder after the operation. Three years and 8 months after the lobotomy, her uterus was removed because of adenocarcinoma. She died one week later. (See Figs. 9, 10.)

Anatomical Diagnosis.—Pyelonephritis with abscesses, purulent cystitis, thrombosis of the iliac veins, bronchopneumonia, bilateral lobotomy. There were deep, round defects in the frontal lobes about 2 cm. and 1.5 cm. in diameter. The blood vessels were thin-walled and no thrombosis or embolus was found. The internal carotids were patent. No metastases from adenocarcinoma were found.

Microscopical Examination.—Thickened pia-arachnoid with miliary meningeomatous formations resembling psammomatous bodies over the frontal lobes. The vessels were dilated; blood and free red blood cells were seen in the meshes of the pia-arachnoid. Cortex showed no significant changes, but the white gyral matter was rarified and lacy. Oligodendroglia was increased and large astrocytes with a smooth glassy cytoplasm and a peripherally located nucleus were seen. This white matter ended abruptly in a large cyst with scalloped edges that sent irregular, long, narrow spears of glial fibers into the cavity in an attempt to bridge it. At the base of these spears there were numerous gitter-cells containing lipid and large astrocytes.

CASE 15.—A.V. This male schizophrenic had metrazol and insulin shock treatments without benefit. He continued to be confused, incoherent, and disoriented. Bilateral frontal lobotomy was performed after 11 years of hospital residence. Post-operatively he developed fever and incontinence of urine for 18 days. The surgical wound healed and the patient was returned to his ward without any mental improvement, remaining irritable, restless, and incoherent. Eight months later, he developed signs of pulmonary tuberculosis and died 1 year,

8 months, and 10 days after the lobotomy (618 days) at the age of 29.

Cause of Death.—Empyema of the left chest, caseous tuberculosis of both lungs. Head: Lobotomy wounds, a small subdural hemorrhage and adhesions of dura and leptomeninges in the frontal area. Brain weight—1150 gms. Depressed area in each frontal lobe especially pronounced in the right frontal cortex.

Microscopic Examination.—Cystic cavity in the frontal lobes demarcated by a gliotic area, scar with round cells, blood vessels and many phagocytic swollen cells, most of them containing fat, a few cells containing iron. The nerve cells in the cortex in the neighborhood fairly well preserved. The whole area represented a scar with cyst formation and many phagocytic elements around it.

DISCUSSION

The cutting of the brain tissue starts a chain of histopathologic events following each other until the completion of the healing. Beginning with edema, hemorrhage, and necrosis of the surgical field, the process continues to bring about the disposal of detritus by gitter-cells, organization by means of newly-formed capillaries (granulation tissue) and filling out of the defect by fibroblastic proliferation. Such is the case in the experimental animals where the wounds were produced by puncture, electrocautery, trypan-blue, etc. In the aseptic wounds of the brains of 70 patients produced by ventricular puncture during the performance of ventriculograms, Baggenstoss, Kernohan, and Drapiewski(9) studied the changes 1 day to 7 years old. They worked out a calendar of cerebral changes in the process of healing of the wounds of the brain. A comparison of the changes in our cases with theirs shows a fundamental agreement, except for a larger extent of damages to the cortex and especially to white matter. The difference is that, while the changes in the center of the lesion in most of our cases tend to follow the pattern of healing, the peripheral areas tend to break anew so that, in one brain section, one could see the changes of different stages, as if the necrosis were extending around the surgical lesion, which was itself in the process of repair.

As has been shown by Macklin(10) and Hicks(11), the introduction of the foreign material into experimental stab-wounds in animals delayed the healing. The bacterial infection, whether by direct extension into

the surgical field or by hematogenous route from a distant focus, plays the same role—it delays the healing. The effect of bacterial infection is obvious. The effect of the systemic disease is more subtle. Our 2 cases of pyelonephritis raised the question whether the condition was preceding, but clinically silent, at the time of the operation.

Influence of acute peritonitis in Case 9 on lobotomy wound was negligible—the wound was clean, due to antibiotics and sulfa drugs. This seems to us to indicate that antibiotics should be used routinely in all cases, as the presence of some silent or obscure condition may not reveal itself clinically for days and weeks. Arteriosclerosis decreases considerably the patient's chances to achieve healing of the wound and clinical improvement. As the brain's activity depends on adequate supply of blood at all times, and the necrosis surrounding the original incision is the result of interference with vascularization, any acute or chronic condition interfering with the blood supply is conducive to anoxemia and will retard the healing of the wound. Arteriosclerotic brain is more likely to respond with hemorrhages and cerebral thrombosis near or at a distance from the surgical field, depending on the distribution of the sclerotic lesions. According to Shenkin *et al.* (12), the cerebral flow and oxygen consumption were decreased in lobotomized patients studied 13-33 days after lobotomy. They explained the decreased flow of blood by the occlusion of many small vessels due to the trauma of the operation, leading to the reduction in the cerebral oxygen consumption. Decrease of the arterial circulation results in anemia and venous congestion in and around the surgical field. Lowered brain metabolism is explained by the interruption of association pathways leading to decrease in the total number of stimuli acting on the brain cells.

Some of our patients died of bacterial infection that was considered due to lobotomy. Others died of what appeared to be a delayed death due to lobotomy. The 31-year-old man who had no epileptic seizures before the lobotomy died in status epilepticus on the 87th postoperative day. Most of the postlobotomy seizures are reported as starting 3 to 9 months later. It seems that dilantin should be used in all cases prophylactically after

lobotomy even if in many cases the seizures are sporadic and mild, and the presence of seizures is compatible with clinical improvement. One patient in whom lobotomy was done for intractable pain died on the 42nd day of asphyxia due to aspiration of food. His wound was complicated by a large hematoma, much necrosis, and no evidence of healing. In a 75-year-old patient dying of aspiration of vomited material, the sections of the brain showed numerous senile plaques and severe arteriosclerotic changes in the arterioles and capillaries, the filling-in of the center of the wound by fibroblasts, and the presence of gutter-cells in the periphery. He could not achieve the healing of the wound with such severe interference of blood supply.

The basis of all these changes is vascular and anything interfering with the quality of the blood, such as bacterial infection, toxins, or disturbance of electrolyte balance, any illness affecting the structure of the blood vessel wall such as arteriosclerosis, luetic endarteritis of small vessels, or any debilitating disease such as carcinoma, slowing the blood flow and predisposing to thrombosis, tend to interfere with the repair of the wound of the brain. This survey showed that the active degeneration goes also side by side with proliferation in the patients with a long survival. Undoubtedly, more fibers are cut than is the surgeon's intent, and the amount of tissue cut, the plane of section, the chronic brain infections, systemic infections, cerebral atrophy, etc., influence the final outcome of the lobotomy. None of the lobotomy wounds in our series was quiescent. Even in the case of 5 years' and 4 months' duration, there was evidence of a smouldering process—cystic formations in the center with degenerative changes at the periphery. The thalamus showed numerous old cystic formations in this case. The brain heals slowly, but owing to its richer vascularization the cortex heals faster than the white matter. When uncut brain is examined, the cortical wound appears either healed or almost healed, but when the brain is cut, the enormous loss of white matter belies the external appearance. The microscopic findings support this impression—when the cortex of the frontal lobe is examined, the cortical lamination is preserved,

although tinctorial changes, diffuse loss of the cortical cells, and gliosis are present. In the same slide, the white matter may show continuous destruction and no evidence of repair. Subdural hematomas were a frequent finding due to laceration of the delicate vessels between the dura and the pia-arachnoid. The localization of lobotomy lesions was varied. The plane of insertion of the leucotome differed from case to case, and the lesions were frequently asymmetrical in the same patient. That mortality is 3-6% in recent cases and 8-10% in old cases, as reported by Worthing *et al.* (2), may be due to the fact that chronic patients are prone to chronic diseases affecting the postoperative healing. Our impression is that the healing may proceed satisfactorily to be interfered with by an illness that affects the cerebral vascular system. The larger number of our patients died of causes not immediately related to lobotomy. The reaction of these conditions upon the repair of the brain wound is comparable to prolonged irritation of the experimental wounds in animals. We found thickened infiltrated meninges, subdural and intracerebral hemorrhages, large cystic cavities with phagocytic activity at the periphery even in old cases, dilatation and deformity of the frontal nuclei, especially the parvo-cellular areas of the nucleus medialis dorsalis and, in several cases, of anterior nuclei, degeneration of the nerve fibers at the distance from the surgical lesion and numerous tiny areas of demyelination, not unlike the focal areas of demyelination in disseminated encephalitis or multiple sclerosis. There is no reason to suppose that clinically improved patients have less extensive changes than the ones encountered on the post-mortem examination. On the contrary, Meschan and Scruggs (13), who did pre- and post-operative pneumoencephalographic studies up to 20 months, report that the patients with normal pneumoencephalograms before lobotomy showed diffuse dilatation of the lateral ventricles and significant absence of the air in subarachnoid space postoperatively, and that 4 of 5 who showed dilated ventricles before the operation developed large porencephalic cysts. The lobotomy is a method of great possibilities that is influenced by the state of health and of the cerebral circulation

of the patient, to such a degree that the patient should be considered a medical as well as a psychiatric problem. The remarkable thing is that, in spite of this large incidental destruction of the brain tissue and the slowly progressing degeneration at the periphery of of the original lesion, the patients improve and about 25% of them return to the community.

SUMMARY AND CONCLUSIONS

The objectives of this survey were the study of the brain changes following lobotomy and the influence of infection, toxins, systemic disease, etc., on the course of healing of the wound. The findings in the cases of long and short survival are compared and evaluated.

1. The brain wound is larger than the original incision in all cases.

2. The process of repair in an aseptic wound is slow and when completed results in cystic necrotic formations in the white matter of frontal lobes.

3. The cortical wound heals faster than the subcortical.

4. The meninges are thickened and there are often adhesions between the dura, leptomeninges, and the cortical wound.

5. The process of repair may be greatly retarded by bacterial infections, toxins, focal and systemic infection, nephritis, etc., preceding or following lobotomy.

6. Because of technical difficulties, more tissue is destroyed than the rationale of this treatment warrants.

7. The clinical expression of this added destruction may account for many symptoms beclouding the release of tension and anxiety achieved by sectioning of the thalamofrontal fibers.

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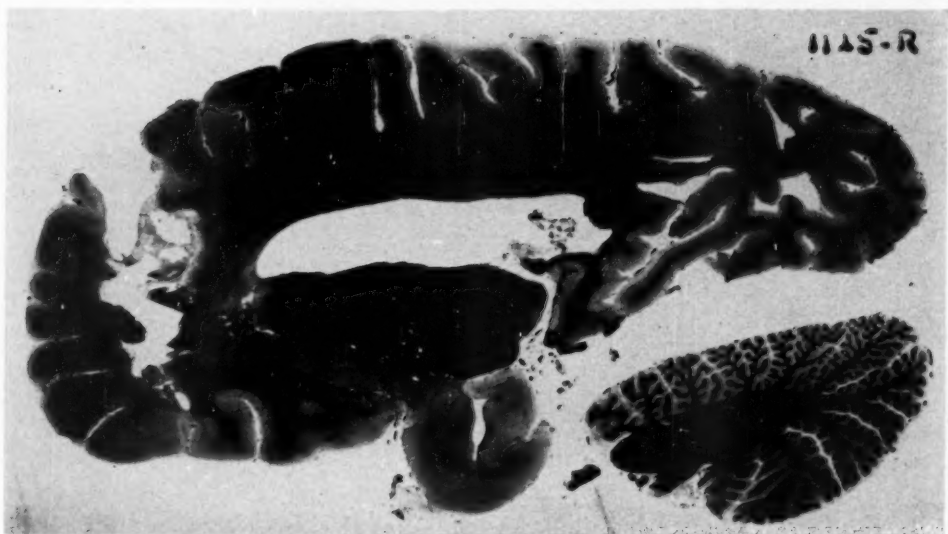


FIG. 1.—Case 1. Atrophic thalami. Large encapsulated abscess in the right frontal lobe extending upwards to the surface of the brain and downwards to the orbital surface.

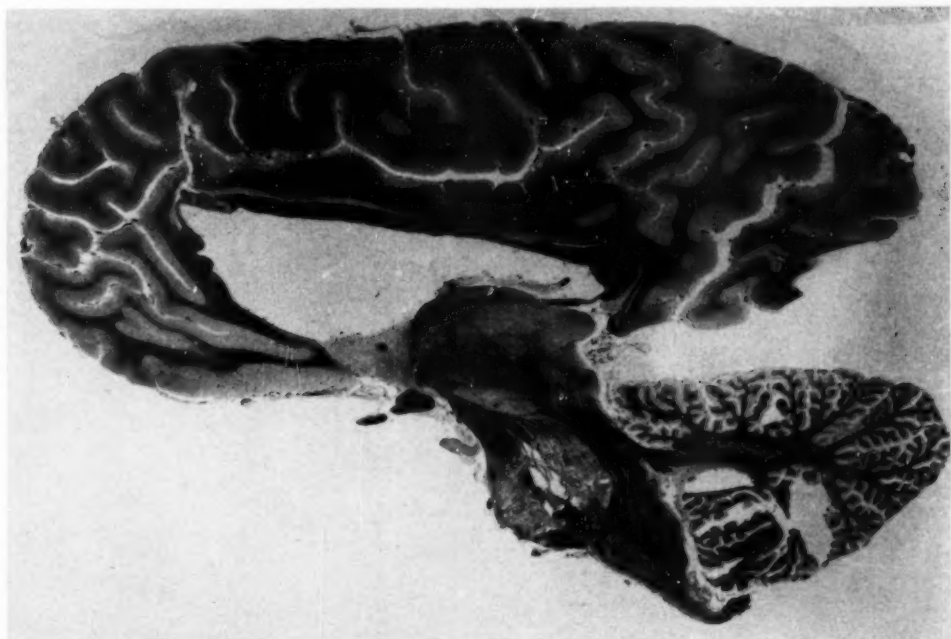


FIG. 2.—Case 2. Basal meningitis. Cystic formation in the white matter of the frontal lobe. Necrosis of the pons and the thalamus due to septic thrombosis of the thalamic branches of the posterior cerebral artery and of the basilar artery. Demyelination of the corpus callosum.



FIG. 3.—Case 5. Bilateral hemorrhagic necrosis involving the corpus callosum heads of both caudate nuclei and communicating with both ventricles, which are filled with blood. Thalami are atrophic.

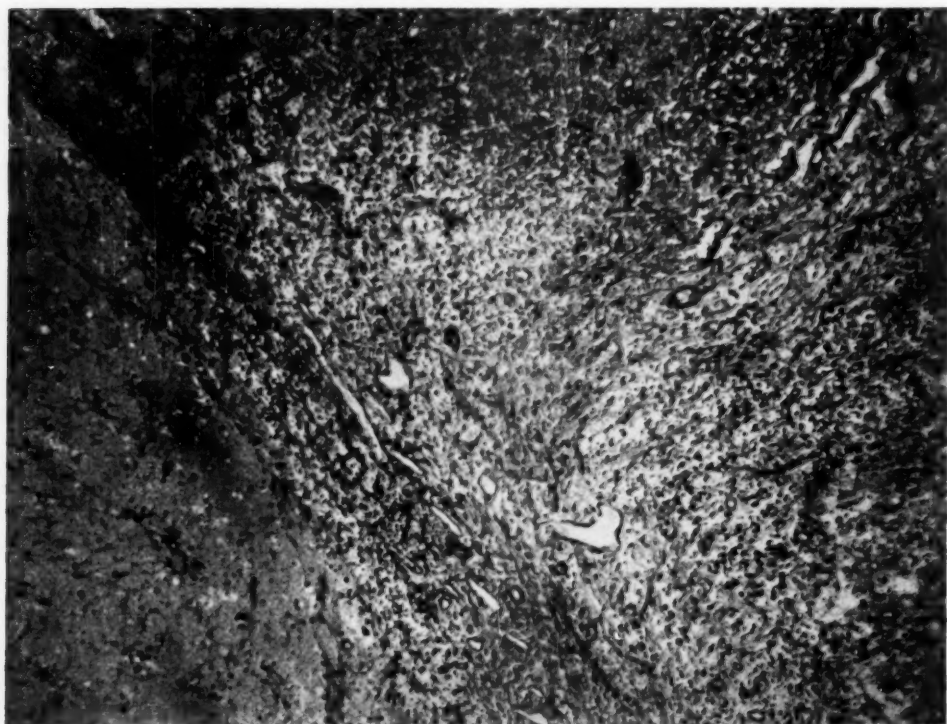


FIG. 4.—Case 5. Surgical lesion, necrotic edematous tissue with numerous polynuclear leucocytes, lymphocytes, and plasma cells, proliferation of blood vessels, astrocytosis, and fibroblastic proliferation.

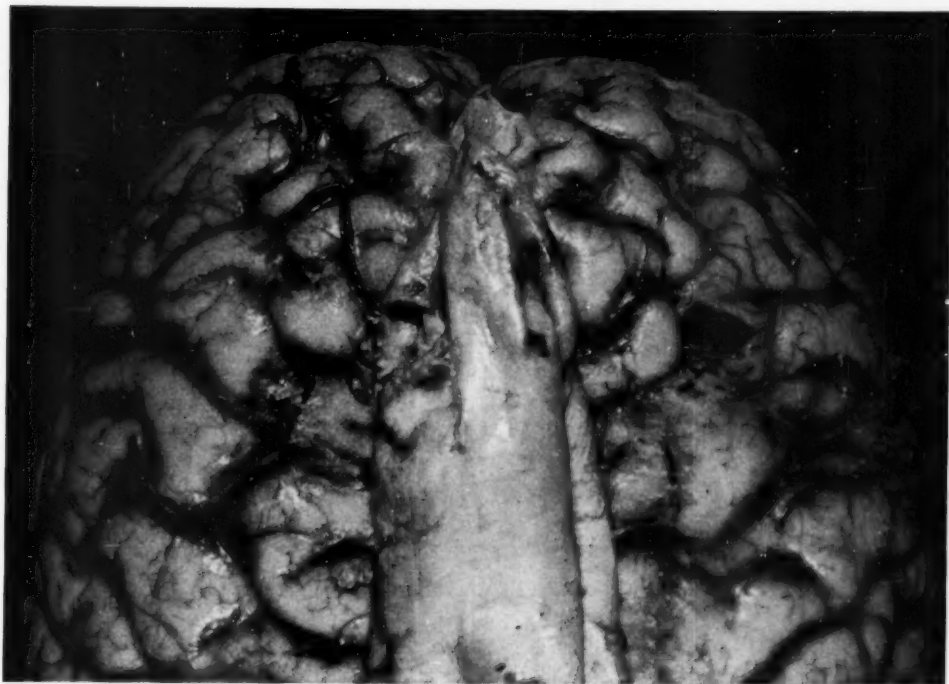


FIG. 5.—Case 6. Cerebral edema. Surgical fields asymmetrical and placed too far back.

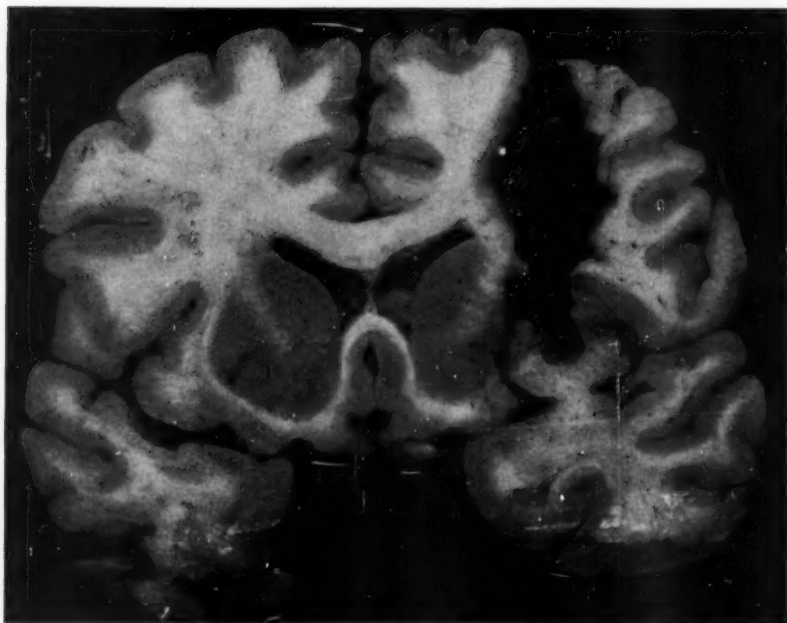


FIG. 6.—Case 6. Large blood clot in the left frontal lobe dividing it in two, destroying the capsula interna, island of Reil and extending toward the isthmus of the temporal lobe.

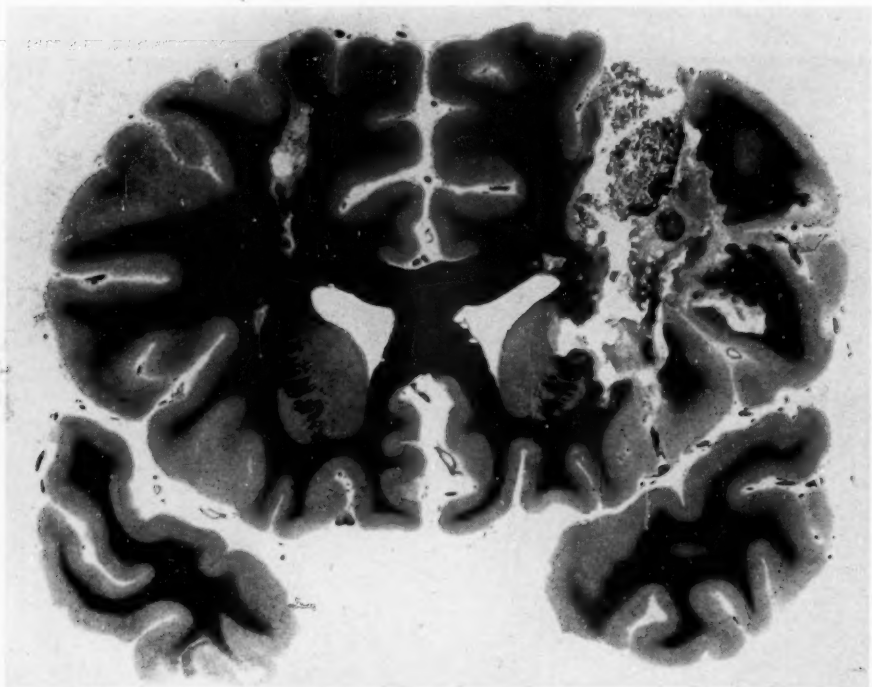


FIG. 7.—Case 6. Coronal section. Loyez stain showing the extent of destruction especially of the left F2 and F3, internal capsule, left caudate nucleus, and left putamen. Small areas of degeneration in the white matter of right F1 and F2. The right caudate nucleus and right putamen are spared.

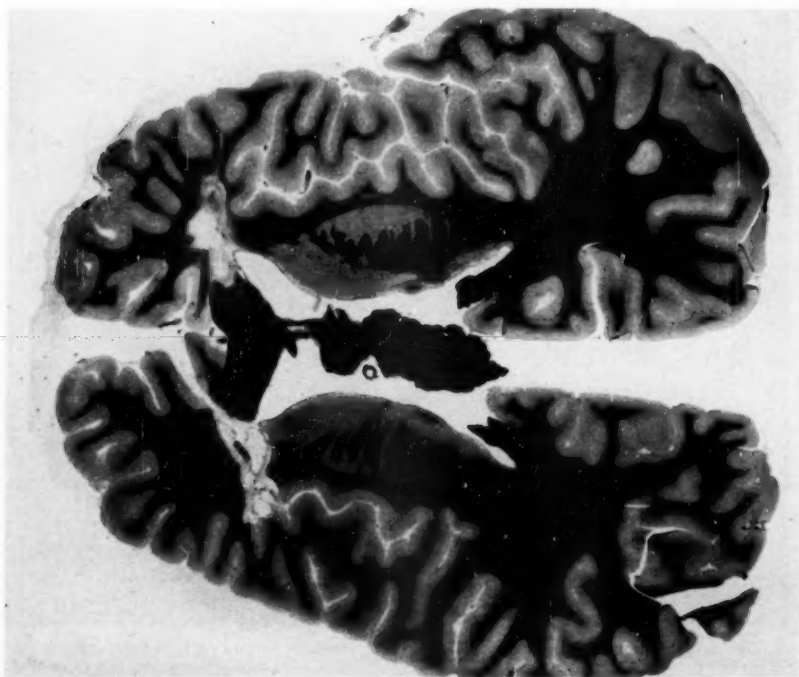


FIG. 8.—Case 7. Bilateral cystic degeneration cutting off the callosal fibres. The cyst on the right communicates with the right frontal horn, cuts off the anteroventral tip of the head of the caudate nucleus.



FIG. 9.—Case 13. Horizontal section. Loyez stain. Large cystic formations in the white matter of both frontal lobes outlined by the wall of connective tissue fibres. Porencephaly. Peripherally to the wall there were numerous macrophages filled with fat.

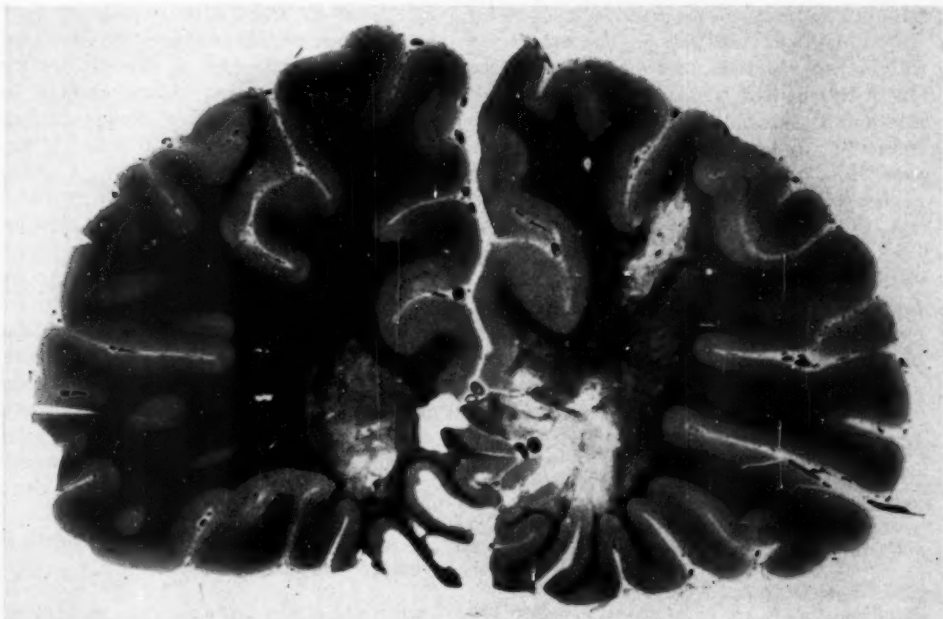
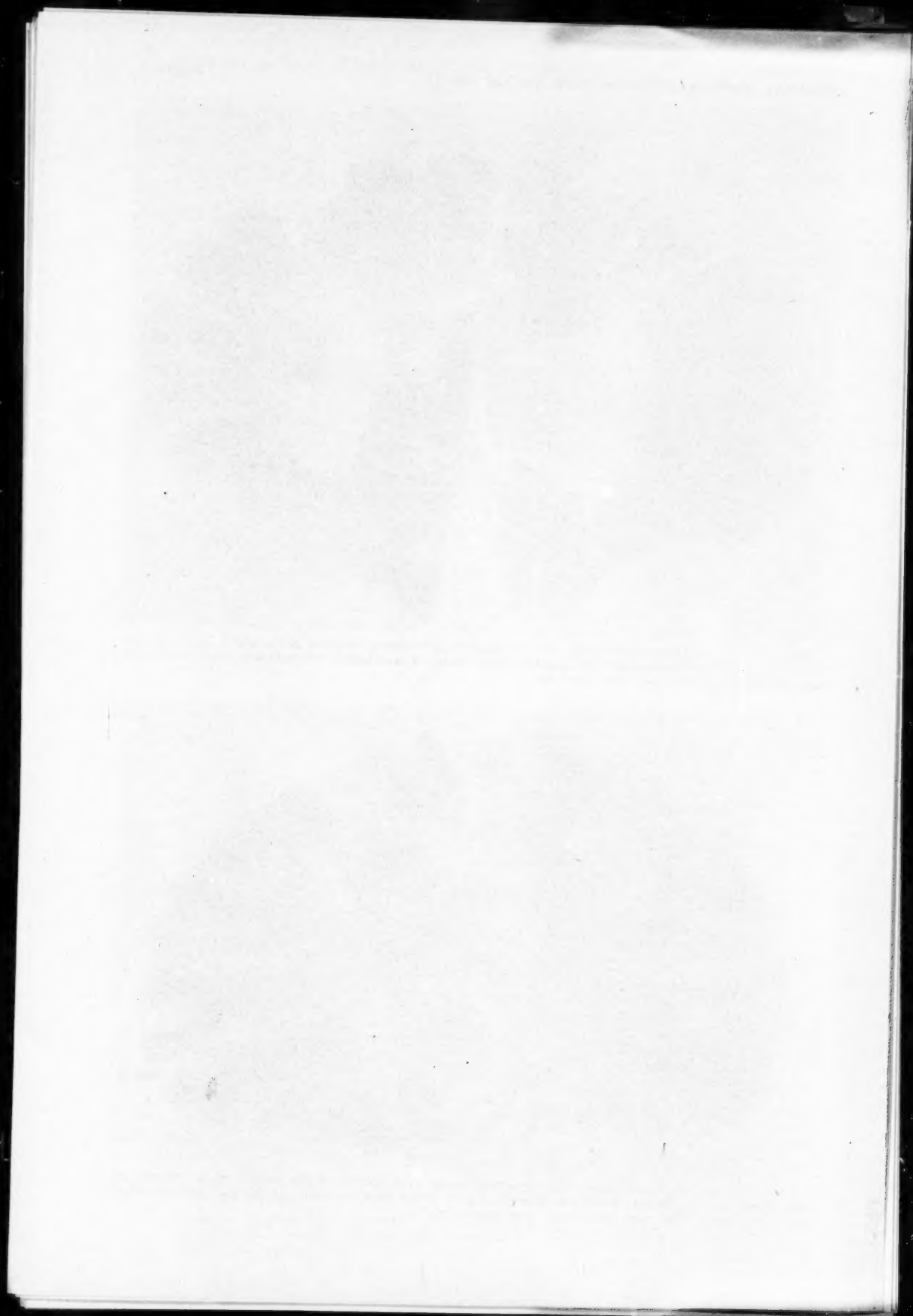


FIG. 10.—Case 14. Cysts with scalloped edges in the white matter of the frontal lobes. Microscopically there were spears of connective tissue trying to bridge over the cyst. At the base of these spears were glitter cells filled with lipoid and large astrocytes.



STATE-SUBSIDIZED CARE AND TREATMENT OF MENTALLY ILL CHILDREN IN MASSACHUSETTS¹

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It is over a century and a half since Pinel in France and the Tukes in England unshackled their patients and introduced the concept of humane care. During the past 75 years, a concept of dynamic psychiatry has evolved and, aided by the impetus of 2 world wars, has been applied particularly in the field of outpatient psychiatry. The psychiatric focus on adults has followed the classical medical investigations—working from the most bizarre to the borderland—but somewhat strangely, our attention has been applied in reverse order to children, where slightly over 30 years ago the entering wedge, on an outpatient basis, was advanced in the form of the child guidance movement.

Several reasons may be advanced for such an approach to working with children. The child is not a "free" agent in his search for a physician, rather is he dependent on the intercession of adults for such help. Usually, the child is physically smaller than the adults who minister to him and can, therefore, be forced to comply with adult dictates. All adults have traversed the course of childhood once and possess an experiential notion of how a child should perform. Necessarily, then, the approach is complicated by adult ideas of "what the child needs" and, to some degree, by an application of previously learned methods of administration as practiced with adults.

In such an atmosphere, the children's unit, sired by legislative request and nurtured by the Department of Mental Health, made its appearance at the Metropolitan State Hospital in December 1945. Just recently, this "exceptional child" attained its sixth year, so the time has come for a periodic pediatric checkup to assess the developmental progress and to attempt to predict the form of future growth.

It would be of little value to examine the unit without first structuring some frame of reference. In 1950, the population in Massa-

chusetts was registered as 4,690,514. Of this, there were approximately 1,104,000 (23%) children under the age of 15 years.² During the same year, there was an average census of 25,055 adult inpatients in state mental hospitals. Some 5,185 individuals were in the state schools for the feeble-minded, 1,046³ being under the age of 15 years. There were housed in the state prisons some 4,856 prisoners (1). The Youth Service Board, during 1950, administered to 1,637 children under 16 years and has a total population of 2,480 under its supervision.⁴ During 1950, the Department of Public Welfare administered to the needs of 139,073 adults and an additional 38,354 individuals, the latter under the Aid to Dependent Children and the Division of Child Guardianship.⁵

Thus, a sizeable segment of the population is involved in circumventing problems with difficulty. It is to be expected that both outpatient adults and children involve an even larger group of individuals. A complete program of psychiatric service must include the heretofore missing quadrant representing inpatient care and treatment of mentally ill children. It is postulated that in this quadrant should be sought the linkage of subacute behavioral deviations as seen in outpatient clinics for children to psychotic and other chronic adult deviations as encountered in outpatient and institutional facilities for adults.

Estimates in Massachusetts in 1938 indicated an expected range of from 35 to 500 "psychotic" children to be in need of inpatient care and treatment. Though a reliable estimate is at present impossible, the figures about to be offered were gathered during the first 6 fiscal years of operation of the unit

² Information Service, Boston Library.

³ In residence as of June 30, 1947. The 1950 figures are not available but approximate these figures (Division of Statistics, Department of Mental Health of Massachusetts).

⁴ Youth Service Board, Parole Division.

⁵ Division of Research and Statistics, Department of Public Welfare of Massachusetts as of December 1950.

¹ Read at the 108th annual meeting of The American Psychiatric Association, Atlantic City, N. J., May 12-16, 1952.

and represent the situation confronting us in Massachusetts. Inasmuch as the unit is as yet functioning on large adult wards under somewhat trying physical circumstances and personnel shortages, it is pointed out that these figures only approximate a minimal estimate of what might be accomplished under more favorable circumstances as envisioned for the future.

TABLE 1
ADMISSIONS

Year	Girls	Boys	Total	Ratio
1945-46	41	82	123	1: 2.0
1946-47	56	170	226	1: 3.0
1947-48	77	196	273	1: 2.5
1948-49	64	228	292	1: 3.6
1949-50	76	196	272	1: 2.5
1950-51	64	168	232	1: 2.6
Six-Year Totals ..	378	1,040	1,418	1: 2.8

home is primarily engaged in diagnostic studies, the number of commitments from the Youth Service Board for longer term treatment has not altered appreciably.

Table 2 indicates the type of commitment and the frequency which used. Noteworthy points are the introduction of the voluntary commitment (Section 86A) in 1948 with a consequent decrease in the number of temporary (10-day—Section 79) and observational (30-day—Section 77) commitments. The voluntary commitment is considerably more adaptable to the needs of the child and obviates the necessity of the court procedure of the Section 77 commitment. The drop in court observational (35-day—Section 100) cases was previously accounted.

The referring agency in 718 (approximately 50%) instances was the court with 489 at the behest of the court in view of a

TABLE 2

TYPES OF COMMITMENT AND FREQUENCY WHICH USED

Year	T. C. 79		Obs. 77		Obs. 86A		Obs. 100		R. C. 51		R. C. 77		Vol. 86A		R. C. 100	
	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.	G.	B.
45-46	5	13	9	31	0	0	7	19	13	10	7	9	0	4	0	2
46-47	18	16	24	79	0	0	17	64	8	10	7	15	0	3	1	2
47-48	18	22	24	78	0	0	23	97	12	11	10	14	5	8	0	4
48-49	6	25	18	41	5	13	24	90	3	7	8	13	11	59	1	3
49-50	10	14	12	22	8	17	21	65	7	8	5	7	25	96	0	1
50-51	17	23	18	26	3	6	11	51	5	9	9	6	21	70	0	1
	74	113	105	277	16	36	103	386	48	55	46	64	62	240	2	13

The salient features relating to the number admitted show a rapid rise from 123 admissions the first year to 292 admissions the fourth year with a decline in the number of admissions to 232 in the sixth year—the 6-year totals being 378 girls, 1,040 boys, total 1,418 admissions. The ratio of girls to boys is 1: 2.8 and this has fluctuated from 1: 2 to 1: 3.6 over the years with the number of boys consistently exceeding that of the girls. Ninety percent of all admissions are for one time only. One in 15 admissions constitutes a second admission. One in 50 is a third admission and one in 100 has been admitted oftener than this.

An explanation of the 20% decline in admissions from 1948 to 1950 is found in the opening of a juvenile detention center in Boston with a corresponding decrease in court observational cases. Since this detention

misdemeanor or felony committed by the patient, and the remaining 229 being committed by the court for a 30-day observational period at the request of an applicant, usually a parent, requesting such observation for a study of an emotionally disturbed, mentally retarded child. Private physicians referred 224 admissions while the Youth Service Board and its predecessor referred 170, and the state and local child welfare agencies accounted for 183. The remainder was referred by guidance clinics, study homes, private children's institutions, and Department of Mental Health agencies, such as state clinics, hospitals, and schools.

The average length of stay of those individuals brought to the hospital primarily for observational study was 27 days. The average stay of all other patients was 17½ months but 2 diversely operating factors influence

this figure, making it difficult to interpret. First, a patient must be either discharged or transferred on the attainment of age 16 and, second, no differentiation has been made between those patients who respond to treatment and those who do not. For those individuals staying in the hospital less than a year, exclusive of observation and transfer or discharge at age 16, the average length of stay is between 6 and 7 months. While symptomatic improvement occurs in most instances in these children by the time of discharge, it should be noted that this average estimate of the time required to return the individual to the community could easily be altered by such factors as number of personnel available for treatment purposes, un-

the re-opening of school in the fall are all related to the lower monthly admission rates while the spring months are related to the greatest number of admissions, about one-third of all admissions being accounted for in one-fourth of the time.

Table 3 illustrates the age on first admission and the fluctuating ratio of girls to boys.

Through the seventh year, the ratio of girls to boys being admitted remains close to the over-all ratio of 1 to 2.8. The majority of the patients admitted in this age range constitutes problems of neurological disorganization, usually of a diffuse character, which are complicated by the psychological stresses in the form of the anxiety, guilt, and rejection of their parents and siblings.

TABLE 3

AGE ON ADMISSION

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Girls ..	1	9	4	6	9	21	11	6	11	15	29	38	72	113	345
Boys ..	4	11	16	12	25	25	55	52	74	83	94	140	184	202	977
Ratio..	1:4	1:1.2	1:4	1:2	1:2.7	1:1.2	1:5	1:8.7	1:6.8	1:5.5	1:3.2	1:3.7	1:2.5	1:1.8	1:2.8

derstanding and attitude of the relatives in following the course of the patient's illness, and suitable physical facilities allowing proper classification and segregation of patients.

Another aspect of the analysis concerns the monthly fluctuation in admissions. Peak admissions for girls occur in the months of March, April, May, and July, with March usually leading. Least admissions occur in November, being about one-third the number occurring in March. Other significantly low months are February, June, September, and December. For the boys, the significant peaks occur in the consecutive months of February through May, with the highest number of admissions occurring in April. A second rise in October and November is cut short by the holiday-season low occurring in December and January, December being the month of least admissions for the boys. A second low occurs in September.

Insofar as the time of admission of the child from the community to the hospital is concerned, the following factors appear significant: Thanksgiving and Christmas, traditionally regarded as family affairs; the dismissal of school; and, somewhat surprisingly,

From the eighth to the eleventh year, there is a marked increase in the number of boys compared with girls, averaging out 7 boys to every girl. It is during this age range that the more socially obnoxious and aggressive behavior of emotionally disturbed boys becomes much more markedly apparent than that of the girls. Society's traditionally punitive attitude toward such aggressiveness thereby ensures the earlier institutional recognition of mental illness for the boys.

The last age group, from 12 to 15 inclusive, shows a return to a ratio of 1:3.4 with the fifteenth year revealing a ratio of 1:1.8. At least 2 factors would appear to be immediately involved in the lag in admissions regarding the girls: the fact that many of the girls' symptoms involve only themselves and are of a rather passive character, and the fact that families usually tend to be more protective and supervising for the girls.

A study of the chief presenting symptoms reveals a semantical nightmare of adjectives utilized by law, education, medicine, and the lay public. Among the more exotic and inexact are such descriptive complaints as these: unclean habits—uncouth bowel habits—indecent assault—lewd, wanton, and las-

civious person in speech and behavior—abominable and detestable crimes against nature—disobedience—incurable—and stubborn child. By far the majority of presenting symptoms is voiced in legal complaints, mostly centered around assault (45 girls—145 boys), breaking and entering (3—94), larceny (9—128), runaway (34—55), truancy (8—39), arson (2—13), stubborn child (56—68), and various complaints relating to sexuality as promiscuity (9—0), fornication—carnal knowledge (3—7), lewd, wanton, and lascivious person (2—17), and sexual perversion defined in terms of unnatural act—homosexuality, etc. (2—47). In regard to court observational studies, an ambiguous complaint used is that of "stubborn child," which is to say that the person so accused does not "obey the lawful commands" of the complainant. There is no complaint regarding stubborn adults, giving cause for some concern in the possible wide latitude of interpretation of the "stubborn child" complaint, which frequently is used to cover more socially stigmatic complaints.

Such classical mental symptoms as hallucinations (17—27), ideas of reference (7—24), depression (6—29), anxiety (2—15), mannerisms (3—10), incoherence (7—13), withdrawal (10—19), muteness (13—14), hyperactivity (36—65), and mental retardation (14—29) were also encountered as presenting symptoms. Masturbation (7—12), untidiness (14—22), noisiness (6—8), fire setting (6—45), enuresis (1—10), lying (2—8), disobedience (5—12), and temper tantrums (18—52) comprise the complaints frequently disturbing the parents.

As can be readily seen from the preceding abridged list, symptoms involving another person or his property are much more attention-getting than symptoms more nearly confined to the self. In spite of the fact that one may not be in entire agreement with these adjectival attributes applied to the personalities of our incoming patients, their mention focuses attention on long-held community concepts regarding children that must be taken into account if the care and treatment of mentally ill children on an inpatient basis is to be at all comprehensive. Thus, such a unit must be prepared to receive mentally ill children on the basis of degree of disturbance based on as reliable historic

fact as can be ascertained, rather than on the symbolic values of evilness, malice, guilt, or queeriness, so often implied in the wording of symptoms.

A graph illustrating the IQs registered in 1,296 examinations of the psychologist (Fig. 1) reveals a double-peaked curve with the first, low peak occurring in the IQ range from 11-20 and the second, high peak occurring in the IQ range of 91-100. The usual bell-shaped curve, obtained when large samples of the population have been tested, is not duplicated with the mentally ill children of our experience. Rather, there has been a downward shift with a much heavier weighting of the curve in the IQ range 71-100 than from 101-130. Not infrequently, 20-to-30 point fluctuation occurs as the course of the patient's illness shifts. Where more than one examination has been done, the figure considered closest to optimal has been used. Reading and speech disabilities are commonly encountered in the 71-90 IQ group. With this weighting of the curve toward the lower side of the intelligence scale, it is apparent that special educational assistance and techniques need be more prevalent in a mental hospital for children than in the community, particularly in the convalescent phase of the illness.

Utilizing the American Psychiatric Association classification of mental illness that was official during 1945-51, a tabulation of diagnostic categories was made, shown in Table 4.

Whatever the shortcomings of such a classification are, there has been some value in such diagnostic sorting if only to point up certain areas in which a greater degree of differentiation is needed. This is particularly true of the diagnostic entity, primary behavior disorder in childhood, which diagnosis was made in about one-half of all admissions (48.8%). The other major classifications in order of frequency made were as follows: mental deficiency (13.4%), psychopathic personality (8.8%), psychoneurosis (6.6%), schizophrenia (6.2%), psychosis with other changes of the central nervous system (4.8%), psychosis with mental deficiency (3.7%), epilepsy (2.1%), psychosis with psychopathic personality (1.1%), undiagnosed psychosis (0.9%), manic-de-

pressive psychosis (0.4%), traumatic psychosis (0.3%), psychosis with epilepsy (0.3%), and no other condition (1.0%).

Eighty percent of the diagnoses made fell within the category, "without psychosis." Since 60% of all admissions were for obser-

an administrative standpoint. It would appear more feasible to sort out from the community those children who have demonstrated repeated difficulty in adjustment to various individuals and/or agencies, either dealing with, or being a part of, their prob-

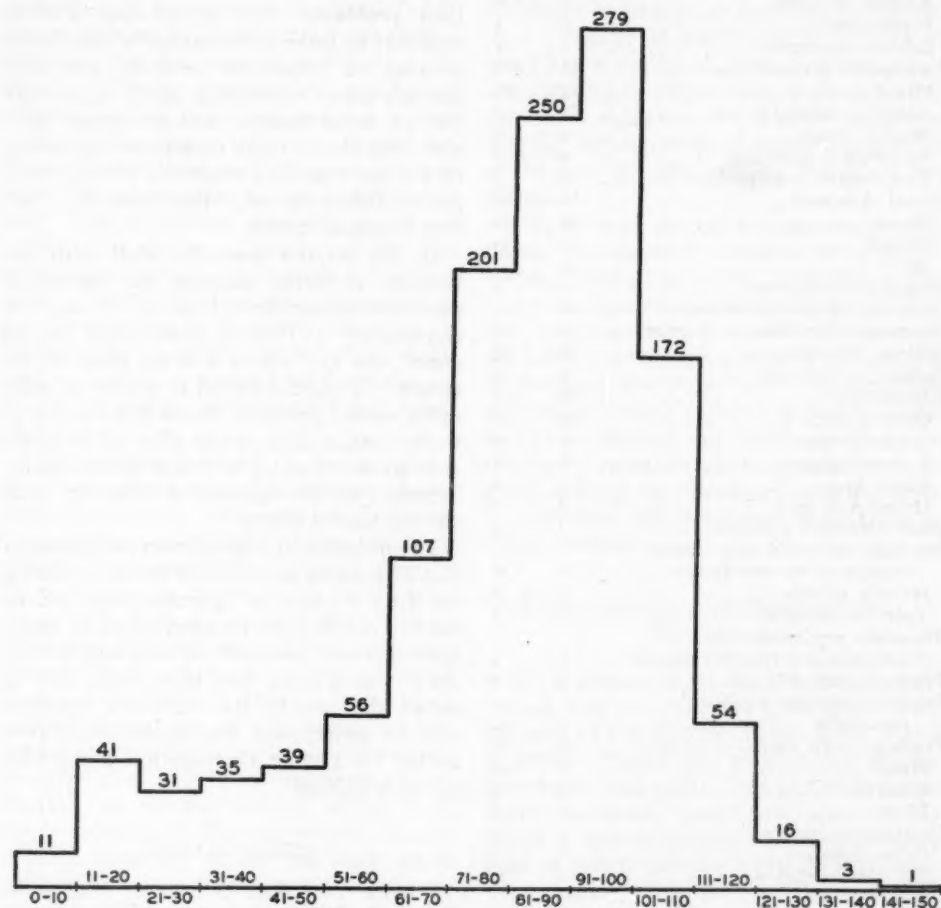


FIG. 1.—IQs registered in 1,296 examinations by psychologist.

vational studies and the majority of these received recommendations that provided for treatment plans outside the hospital, the other 40% (567 children) remained for a lengthier period of time. Of these, approximately half were placed in diagnostic groups regarded as "with psychosis" and half were regarded as "without psychosis."

As might be expected, then, the use of the term "psychotic" serves little purpose from

lems. A child who has been placed in 20 different foster homes in 3 years will not profit by the twenty-first, no matter how "good" a home—a child leading race riots will not become less aggressive in response to physical or psychological intimidation—a child attempting to solve his problem by running away must ultimately be confronted by the problem when he stops—a child who feels inadequate in his ability to learn or

TABLE 4

	G.	B.
Primary behavior disorder.....	125	567
Conduct disturbance.....	94	433
Neurotic traits.....	31	134
Psychoneurosis.....	33	60
Mixed type.....	21	44
Anxiety state.....	1	8
Anxiety hysteria.....	7	0
Psychasthenia.....	0	3
Reactive depression.....	4	5
Psychopathic personality.....	17	109
Mixed type.....	13	78
Asocial or amoral trends.....	4	15
Asocial trends.....	0	6
Pathological sexuality.....	0	8
Pathological emotionality.....	0	2
Mental deficiency.....	60	130
Moron.....	22	72
Imbecile.....	19	34
Idiot.....	19	24
Borderline intelligence.....	0	5
Posttraumatic behavior disorder.....	0	3
Postencephalitic behavior disorder.....	1	3
Epilepsy, idiopathic.....	10	15
Epilepsy, symptomatic.....	2	5
Schizophrenia.....	38	51
Other types.....	24	41
Catatonic type.....	9	9
Paranoid type.....	0	1
Mixed type.....	3	0
Hebephrenic type.....	2	0
Manic-depressive psychosis.....	5	1
Psychosis associated with organic changes of nervous system.....	26	37
Juvenile paresis.....	3	2
Tuberous sclerosis.....	1	1
Traumatic psychosis		
Posttraumatic personality disorder...	0	4
Psychosis with epilepsy.....	4	0
Psychosis with psychopathic personality.....	4	12
Psychosis with mental deficiency.....	23	30
Moron.....	9	15
Imbecile.....	6	9
Idiot.....	8	6
Undiagnosed psychosis.....	6	7
Other diseases.....	1	1
No other condition.....	4	11
Deferred.....	8	

achieve is not made adequate by an adult thinking he could do it if he only would—a child spending more time with his fantasies than in dealing with real problems in integration does not just “snap out of it”—nor does a child who is confused by sexual misconceptions cease his pattern of activity merely

because it is regarded as bad for his health. All these individuals, though not necessarily involved to a degree irrefutably psychotic, must have some place temporarily affording them sufficient protection and understanding to permit themselves to regroup their assets in such a manner as to deal adequately with their problems. The opportunity is then available to make chronologically significant tracings of behavioral patterns, not only through direct observation under some control of environmental and treatment variables, but also to make repeated observations on the more marked deviations through outpatient follow-up and, when warranted, further inpatient studies.

In the enquiry how the adult with behavioral deviation develops his particular pattern of adaptation at least 2 points need be considered: (1) down which road has he gone? and (2) where was the point of no return? It appears logical to search not only in the earlier phases of illness in a more controlled setting than can be afforded by guidance work but to try to define the continuity between earlier behavioral difficulty and chronic mental illness.

In conclusion, it is hoped that the presentation of some of the statistics gathered during our first 6 years of operation may aid in further defining the problem posed in large-scale care and treatment of mentally ill children. An attempt has been made also to define the role of the children's inpatient unit in society and the opportunities presented for further investigation in the field of mental illness.

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REACTIONS TO MUSIC OF AUTISTIC (SCHIZOPHRENIC) CHILDREN¹

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This paper concerns itself with an investigation of the reactions to music of children with infantile autism (childhood schizophrenia). For this purpose 3 children, A, B, and C, displaying characteristic pictures of infantile autism, were selected for special study at the Payne Whitney Psychiatric Clinic. Two of them, A and B, were identical male twins, a situation of special interest in itself, since no autistic twins, and in fact no 2 children in the same family with this disorder, have been thus far reported in the literature. These 3 children were diagnosed as autistic according to the criteria set down by Kanner, who regards infantile autism as the earliest form of a schizophrenic reaction in which no normal development has taken place(4).

The problem appeared to be of special significance, because the occurrence of unusual reactions to music seems to be a frequent finding in autistic children, although a definite statement in the literature concerning the statistical frequency of such a phenomenon is lacking. Despert has stated to the writer (unpublished) that a unique reaction to music is, in her experience, a general finding in autistic children. Beata Rank indicates that in atypical children (a nomenclature that appears to include children classified by other writers as autistic or schizophrenic) an unusual musical ability is a frequent finding(7). Case histories of autistic children reported in the literature often mention an unusual interest in, unique response to, ability for, or production of, music(2-4, 7). Kanner, who in 1951 reported on having seen nearly 100 of these children(5), has indicated a frequent unusual memory for songs—in addition to rote memory for other things such as poems and lists of names. He cites examples of one infant who could reproduce 37 nursery songs, and another who could distinguish between 18 symphonies(4). In an unpublished statement, he says, "Most

of the parents made some reference to the children's interest in, or fondness for, music. . . . 'Music,' in these reports, included a considerable variety of items: humming, singing, listening to songs, more or less selective interest in radio music, taking part in group singing, identification of tunes, recognition of victrola records, playing pieces on the piano."

Despert in an unpublished statement to the author characterizes reactions to music of autistic children as unique, indicating a special preoccupation with, and a special ability for, music without, however, utilization of the latter in a normal manner. From perusal of literature, one might describe the reactions to music of autistic children in general terms as (1) an unusual interest in music, (2) a tendency to sing differently from the average child, and (3) an oftentimes unusual ability to reproduce familiar pieces with extraordinary accuracy.

EXPERIMENTAL AND OBSERVATIONAL PROCEDURES

In the present study, the following experimental and observational procedures were devised: (1) In the cases of the twins, A and B, special attention was given to their singing over an 8-month period during weekly therapeutic sessions. Toward the end of this period 2 special experimental sessions were held, in which the singing of both children was simultaneously recorded by a Revere Tape-Recorder. Observations were made on the clinical manifestations occurring in connection with the singing. Attention was also paid to stimuli that appeared to induce or affect the singing. Musical notations of selected examples were made by the writer later from the recordings. All but 3 of the notated examples to be presented in this paper are taken from these recorded sessions. (The author relied on his own musical training for the notation and explanation of these examples.) In the case of C, a similar recorded session was held, along with the use of

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various stimuli, without, however, the occurrence of singing. (2) In the cases of B and C, careful observations were made of the reactions of the children to selected music played on the piano by the writer. Special attention was paid to reactions to repetition in music, familiarity, different registers (high or low on keyboard), discords, and incomplete endings. In the case of C, such observations were made during 2 special experimental sessions. In the case of B, where the author was also the therapist, observations were made during weekly sessions over an 8-month period; some therapeutic application of the use of music, to be described, was also attempted.

The 3 case histories will now be given in summary. History of reactions to music will be presented separately and in detail, prior to the presentation of experimental findings and observations in each case.

CASE MATERIAL

The twins, A and B, are the children of a narcissistic, rather detached, attractive, and immature mother and a compulsive but intelligent father. Delivery and first days of life of both children were essentially normal. Little of an abnormal nature was noted by the parents in the first 9 months of life, except that the infants appeared to be somewhat unresponsive to adults. To quote the mother in regard to the older twin, A—her particular favorite—"he had a glassy stare and looked right through me." It was after the first year of life that the father, in particular, became gradually convinced that there was something wrong with the children. By contrast, the mother remained strangely detached and unconcerned up to the time of admission. After a brief period of playing with each other at 9 months, the larger of the twins, A, became aggressive to the smaller, B, hitting him frequently, after which A and B began to ignore each other, eventually almost completely. Around the age of 1 year, prolonged rocking motions and the banging of heads against the wall were observed. Motility development in both cases was, if anything, extraordinary in the agility achieved, especially in the case of B, who was the more active. Bowel training at a year and a half was rejected and not understood. Feeding difficulties appeared in both children, more pronounced in the younger, B. Speech did not develop normally. B had never spoken at the time of admission at age 3½. A had said "Mama" and "Papa" from the age of 12 months without apparent meaning in the sense of communication. In the last year he had said "No" with apparent desire to communicate. During their second year it became increasingly clear that the children were essentially unresponsive to adults. Verbal demands were char-

acteristically ignored. In fact, only an interest in music on the radio, and records, especially pronounced in A, prevented the parents from suspecting deafness in the children. A was clinging and tenacious to his mother, ignoring all other adults. B appeared somewhat more responsive to his father than to other adults, but in general ignored all people.

From age 18 months on, the father sought treatment and medical examinations for the children. Initial formulations were based on possible jealousy between the children, and the parents were advised to separate them. It was not until almost age 3 that a diagnosis of infantile autism was finally established by Dr. J. L. Despert, to whom the children were referred. The children first came to the Payne Whitney Clinic for examination around the age of 3½. It was decided that because of A's relationship with his mother he would best be treated by a female therapist whereas B, who appeared to relate best to his father, came under the writer's care. At this time the following behavior in each case was displayed: A restricted his diet to baby food, wet himself every night and frequently during the day, was not bowel trained, compulsively scratched the floor with sharp objects and pencils, displayed compulsive rocking motions, oftentimes would bite himself or hit himself, spoke infrequently with limited vocabulary and without much apparent desire to communicate, achieved extraordinary symmetrical patterns in playing with blocks or other objects, strove consistently for sameness in environment, appeared especially preoccupied with music and singing and more interested in objects than people. B was rather more agile and active than his brother, less responsive to people, did not speak at all, had more pronounced feeding difficulties, and whereas rocking motions and tantrums were frequent he did not hurt himself so much. He was especially preoccupied with light and shadows, rather more than his brother who, however, also displayed such interests. He was fascinated by mechanical gadgets; play was less varied and consisted of compulsive turning on and off of lamps, which occupied most of his attention, and in unraveling of string. Interest in music was less marked than in his brother. At the time of admission and during most of the therapeutic course, B was almost completely separated from his brother and cared for during the day by a rigid, ignorant, and rather rejecting woman, hired by the parents.

The children were first seen in April 1951. Therapy continued until January 1952. In the first 6 months both children showed some improvement. In the case of A, feeding difficulties decreased; the child became somewhat more responsive and less anxious. In the case of B, improvement was slightly more marked. Responsiveness to adults increased more. Speech appeared for the first time with the word "car," which brought B to the clinic. He became more responsive to verbal demands, especially those of the therapist. Feeding improved greatly. Both children appeared to form meaningful relationships with the therapists in contrast to the beginning when the therapists were completely

ignored or treated as objects in the room. Part of each weekly therapeutic session was devoted to having the twins and therapists together in the same playroom. In the last 4 months of therapy many of the gains were lost. This situation was attributed to growing family unrest, tension, and anxiety that was reflected in the children. Clinic visits were cancelled, especially in the last month. The children were finally taken, in January 1952, to the James Jackson Putnam Children's Center. They returned briefly after 10 days of observation there, prior to a prolonged period of observation and therapy at the Center.

The third case studied is that of C, first seen at the Payne Whitney Clinic in November 1950 at the age of 3. On admission complaints were as follows: the child did not speak, there was no contact with other children or with adults except with his mother, to whom he was clinging and extraordinarily possessive. Affection for mother was demonstrated by a strange kind of kissing in which he would place his mouth upon her face, making strange noises and rolling his eyes. Play was compulsive and restricted, and oftentimes destructive. Principal preoccupations consisted in listening to music and observing his shadow. Sleep was disturbed. Toilet training was not completely established and bladder control almost completely lacking. Temper tantrums and head banging were frequent. Feeding difficulties were pronounced, the patient refusing anything but baby foods. He exhibited a characteristic desire for sameness in environment, including many demands for special positions of objects associated with routines. The child was delivered by Caesarean section. There was no breast feeding because it was "repulsive" to the mother. He sat up at 6 months, stood up at 9 months, and walked without support at 12 months. Activity, however, was somewhat limited and the child was often rather motionless. Until the age of 2 he was extraordinarily withdrawn and inactive. Between 2 and 3 he became more active, restless, and outgoing. The mother is a singer, compulsive, anxious, and rather detached, or punitive, stutters severely, and has had some treatment for emotional problems. The patient was treated for one year at the Payne Whitney Clinic by a female therapist until November 1951. In the course of treatment the child developed a meaningful relationship with the psychiatrist. Bowel training and bladder control improved. He became more responsive to adults, especially his father, and singularly more affectionate. In the 4 months since termination of treatment improvement has continued. He has become more outgoing, less restless, more responsive to verbal demands, but speech is still very limited.

MUSICAL OBSERVATIONS

As to the unique musical reactions of these children, those of C will be dealt with first. At the age of 14 months, C revealed special preoccupation and absorption with music. He would stand motionless for long periods listening to it. At the same time he reproduced

notes of the scale with extraordinary accuracy of pitch. At the age of 17 months he spontaneously repeated in full a well-known aria from *Don Giovanni* immediately after his parents had sung it. From the age of 18 months to just before 3 years, C sang a remarkable repertoire of music consisting of symphonies by Mozart and Haydn, songs by Schubert and Brahms, selections from *Carmen*, the Tschaikowsky Piano Concerto, and diversified well-known songs. Singing would occur spontaneously. It could never be induced by verbal request, but singing of the melody would precipitate its reproduction by the child. If the last note were omitted, the child would supply it correctly. In addition, the child would transpose the melody to a pitch level in which his voice could reproduce it. He would also improvise on, and vary, known melodies. Occasionally the child would sing apparently original tunes, the nature of which is not recorded by the parents. Such singing discontinued just before the age of 3 at which time the child was becoming somewhat more outgoing and improving in general behavior although speaking little. After age 3 and during and after the therapeutic course, no such unusual singing occurred. Preoccupation with, and interest in, music has become somewhat less strong although still present to an unusual degree. When the child sings at present pitch is no longer accurate and singing resembles that of a normal child his age.

The child was seen by the writer at the age of 4½ in January 1952 in 2 experimental sessions. In the first part of these sessions, the writer played on the piano for the patient. In the first session, selection of pieces was based upon considerations evolved from experience with children in the patient's age group. In the second session the pieces played were almost entirely those indicated by the father as being familiar and having been reproduced by the patient in the second year of life. In both cases the child stood almost motionless, extraordinarily absorbed in the music with no apparent difference in the 2 sessions. After a time he indicated a desire to sit on the lap of the therapist, occasionally placing his hands on the writer's hands and sometimes playing the piano himself. His piano playing was far from haphazard and

indicated an attempt to reproduce the tones played by the writer. In the second session attempts were made to evaluate the nature of the patient's receptivity to music. At all times he appeared to desire the continuation of music constantly thrusting the hands of the writer back onto the keyboard at any point when he discontinued playing. This occurred when the playing was stopped before the end of a piece, or at the end, that is to say, whether or not a musical tension was created. He did not appear to react to discords or false notes, to familiarity to pieces, to changes in harmony or key or rhythm. Finally a so-called "Perpetual Motion" by Poulenc, in which a central series of thematic phrases are repeated endlessly according to the desire of the player, was used. The writer repeated these about 20 times. Through most of this the patient indicated little response. Toward the end, he retired twice to the bathroom, probably representing a diminution of attention and little else since the patient had previously displayed interest in the bathroom. During the second half of the second session (recorder available), the writer also endeavored to produce various stimuli that might produce differential emotions and, in turn, singing. Such stimuli consisted of accepting and demonstrating affection to the patient, frustrating the patient in compulsive play (as for example, taking away an object with which he was playing), creating an anxiety-provoking situation as, for example, demonstrating the tape-recording machine, singing to the patient and speaking with requests and possible interpretations. No singing took place. The patient responded to provoking stimuli by groaning and struggling. Alteration of sameness of environment apparently did not affect him. The writer considers it of special importance that, in the period of improvement and increased development, preoccupation with music and extraordinary singing decreased.

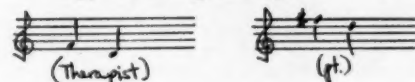
Regarding the musical reactions of the twins, A will be described next. He was profoundly absorbed in listening to music from at least the age of 1½ years. He also sang scales perfectly (checked by writer). He sang frequently—especially folk songs, but also selections from the Pastoral Sym-

phony. In his therapy, except for one session, A was never exposed to any listening to music, except for singing on the part of his therapist, with variable response. It was noted that, when the child appeared especially anxious, singing was characteristically high-pitched and rapid. In addition, motives or parts of the melody were repeated, endlessly at such times, often to the accompaniment of rocking. These parts were sometimes repeated in sequence in rising pitch. No words were ever used. It should be noted that, in musical language, sequential rise in pitch and repetition of motive with greater rapidity denotes rising tension to composers, musicians, and, in fact, those sensitive to music. In the playroom the singing of a familiar tune would often induce a smile in A. At times this response represented the only indication of a relationship to the people in the playroom. Also, it seemed to be the most available means for quelling anxiety.

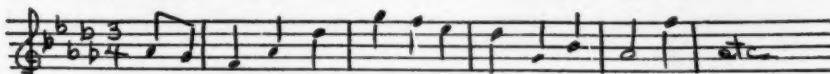
The following examples of A's singing were recorded on a morning when he was exceptionally anxious. He immediately went to his favorite seat on the window sill and would not budge from it during the entire session. There were constant rocking motions in rhythm to his singing. It is to be noted, too, that the singing of the child did not appear to modify his emotional state in any way, although singing to him may have had a slight soothing effect.

Case A—Examples of Singing (no words)

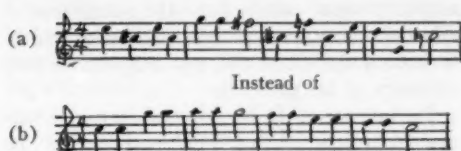
Example (1)—Mimicry of phrase, first sung by therapist, at higher pitch (screaming) indicating anxiety:



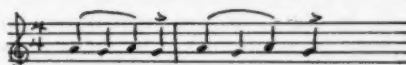
Example (2)—Untiring repetition with little change of long phrases of song, Mocking Bird Hill. This song was on a record frequently played by patient at home. The song was sung at high pitch but essentially accurately as to intonation; it was also rendered at brisk tempo in breathless style, tones sounded with "da" syllable:



Example (3)—Nursery rhyme (Twinkle, Twinkle, Little Star), sung in high pitch, with screaming, variation of melody, and upward distortion of pitch and tonality from A to C (patient generally sang with extraordinary accuracy):

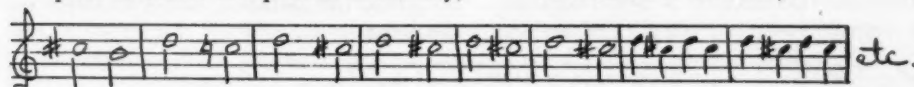


Example (4)—Single musical phrase involving 2 tones spontaneously produced and repeated many times:



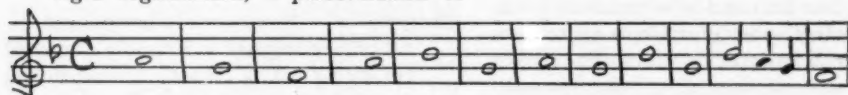
Example (5)—Simple 2-note phrase, spontaneously produced, modified to higher pitch in course of repetition and finally,

at a climax of anxiety, repetition of phrase at twice the speed (diminution of time value of notes):



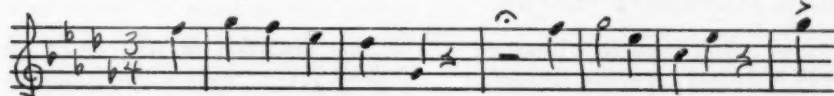
Example (6)—Example of an original, more complex phrase, consisting of long notes accurately sung; phrase shows rather rigid organization, a perseveration of

rhythmic pattern almost to end (whole notes) and clinging to tonality—tones here are mouthed (hum sound):

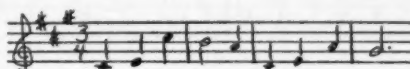


Example (7)—This is a repetition of Mocking Bird Hill later in the morning when the child's anxiety had mounted even

further. There is a "disintegration" or "fragmentation" of melody with only fragments emitted at very high pitch:



Example (8)—Final example was recorded on morning when A appeared happy and more relaxed. Rock-a-bye Baby (without words) was sung accurately and quietly at a much lower and comfortable pitch, and moderate tempo:



To my knowledge this last example was the first time that the child selected a tune (Rock-a-bye Baby) appropriate to his activity. At this point he was playing at the toy house, fondling a crib, and after his singing eventually retiring in a rocking position in the therapist's arms. Frustrating stimuli were not used, but in the second session verbal interpretations, direct requests, and demonstration of affection failed to produce

singing. Singing induced the infrequent singing of the same or a different melody as well as a smile. It should be added at this point that in the first recording session the machine was not completely out of view and indeed A spotted it from the very outset, responding with closing of eyes and an expression suggesting photophobia. This undoubtedly added to the anxiety that the child brought originally to the clinic at that time. In the second

session several weeks later the machine and microphone were well hidden and as far as is known the child did not respond to any evidence of its presence.

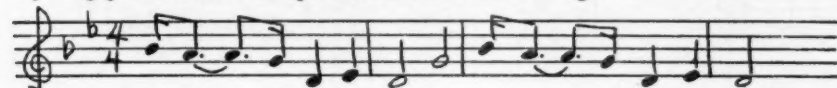
In the case of B, his interest in music was said to be less marked than A. However, he sang simple songs a great deal about the house for 18 months, less accurately, though, than A. In the clinic, the reproduction of well-known tunes attested to by the parents was almost never seen except for one instance, in December 1951 when he would sing phrases of "Jingle Bells," a special

favorite of his. However, in the beginning, B would sing simple 4-note melodic phrases accompanied by a rocking motion and extreme anxiety. These phrases were repeated continually as he stood in a corner urinating next to the door, indicating a constant desire to get out. Examples of such phrases follow:



In the next few months, B would occasionally sing phrases more complicated and not

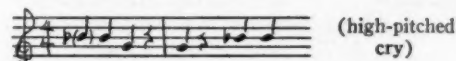
known to the therapist, as for example the following:



In the last few months of therapy in which B was somewhat less responsive, singing increased, but became less accurate in pitch, and completely unrecognizable as regards reproduction of any specific tunes. The author could not sense in these any desire for communication but rather a subjective expression of particular emotions involved.

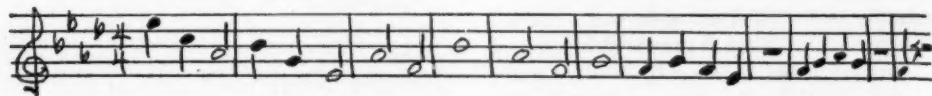
Case B—Examples of (Recorded) Singing (no words)

Example (1)—Rhythmically irregular musical phrase vaguely and rapidly intonated consisting of 2 tones, accompanying frantic play activity, blending into cry when frustrated:



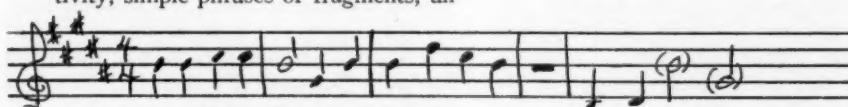
Example (2)—A rapid humming of vague intonation and simple phrases without clear metre, accompanying hyperactivity,

perhaps distortion of tune heard, or original phrase—sounds like fragments with little resolution or completeness:



Example (3)—Like (2) only higher pitched, more lively, humming, during play activity, simple phrases or fragments, un-

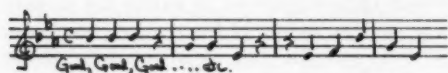
repeated and sometimes loosely related (especially third fragment):



Example (4)—The last example was recorded on a day when patient was more relaxed. At this time his brother was panicky. He sang at moderate speed to

what sounded like the word "good" at low comfortable pitch in very well-delineated and somewhat familiar musical phrases—note also relative completeness

in contrast to unresolved nature of (2) and (3).



In addition, in the case of B, who was treated by the writer, starting from the third session the writer played the piano for the child for about 10 minutes of each session. In general the same selections were repeated each time, with perhaps 1 or 2 new pieces added each 2 or 3 sessions. Compositions chosen were mostly rhythmical. B's initial and characteristic response was one of rocking in time to the music. Rocking characteristically would continue about a quarter of a minute after music terminated. It was noted even in the first few sessions that anxiety could be modified by playing the music. For example, the child would indicate desire to leave the room and stay by the door, rocking. With the playing of the music the child would approach the therapist, appear calm, and climb into his lap. The child appeared to relate to the therapist in terms of the music and the piano. He would place his hands on those of the writer and occasionally play a few scattered notes on the piano. After about 6 sessions he would indicate his desire for the music to continue by pushing the hands of the therapist toward the piano or even guiding the writer to the instrument. In the seventh month he was indicating selectivity for pieces. Sometimes familiarity appeared to be a factor, but mostly it seemed to be based largely on rhythmic content, the child preferring those with a strong rhythm. It did not seem to matter whether the rhythm was basically duple or triple, that is, in march, fox-trot, or waltz form. Register also did not seem to matter except that he appeared to reject pieces in a very low register, that is to say, far down on the piano. Discords did not appear to upset the child. Finishing before the conclusion of the piece also appeared to have no definite effect. The child's appreciation of the piano as an object that created music reached a culmination when on one occasion he endeavored to climb into the piano. The writer made this possible by pulling out the wooden music stand on which the child leaned and which could well have broken.

In addition there was little doubt that the responsiveness to the therapist was originally based upon the association with his producing the music.

DISCUSSION

Despert, in a statement to the writer, outlines the possible significance of the general occurrence of unique reactions to music as follows: First she comments on the exceptional acuity of these children to sound and vibrations, much like that of primitive peoples. She interprets the interest in music as a possible secondary factor based upon the preference of the children for relationships to objects rather than to people who create words. She considers it as part of the total "obsessive preoccupations" of these children, for example, with sound, light, or various objects, or play. However, she also mentions the possibility that it may be a primary factor, that is to say, that the preoccupation with music serves to prevent the development of the means of human communication through language rather than being the result of the barrier of such human communications. In regard to the last point I would say that although in most cases the singing of these children appears to be an experience associated in some way with the emotional state or fantasy life and is not specifically communicative in purpose, there is evidence that occasionally the autistic child may use music as a form of real communication. For example, a mother of another autistic child recounted to me how, when her child displayed curiosity and interest in some bride and groom dolls, she told him what it was and then sang "Here Comes the Bride" with the words. Several days later the child indicated a desire to play with the dolls by singing the musical phrase without the words. A's "Rock-a-Bye Baby" without words, and desire shortly after to lie in his therapist's arms, may represent another example of this.

The possibility that a musical environment may be involved in cases of autistic children who display special ability for, or preoccupation with, music should be mentioned. The parents of C were both singers, and the mother of the twins frequently sang to the children. Moreover, Kanner's comment (5) about the frequent intellectual sophistication

of the parents (universal in his series) further suggests that music and fine records may play a greater part in the environment of these children than in the average home. It is nevertheless significant that such children would demonstrate interest in the music while rejecting most other features of the environment.

Further theoretical speculations on the significance of this unique interest in music may be offered. For example, it has been suggested in the literature that the appreciation of music is based upon very early instinctual foundations and that music is a language belonging essentially to the prephallic or infantile narcissistic period (6, 8). If these autistic children do indeed represent some extreme fixation upon some early stage of infantile or narcissistic development, then the excessive or unique musical preoccupation would appear to belong to the period on which the child is fixated. Surely that is a far more reasonable formulation of the general appearance of startling musical preoccupation or ability than to say that most autistic children are at the same time endowed with special musical talent. Indeed, what we call musical talent may in fact be associated with some degree of fixation on some such infantile period.

It is also possible that these children may be especially receptive to music because it is inherently not so specifically as communicative a language as speech. Indeed, in the average person it is mostly a purely subjective response not designed to communicate anything specific to another individual. Even musicians who play for others may often-times be concerned more with narcissistic desires to impress than actual desires to communicate specific emotions or ideations. In this regard it is interesting that many autistic children who reproduce music do so without accompanying words. When they speak words they often do so in a sing-song manner as if to deny that the words have any special meaning for communicative purposes (1, 5). One might speculate that these children use and respond to words in a manner similar to music, as if words were just like musical sounds. A description of frequent repetition of word phrases at mounting volume and tempo by a 4-year-old schizophrenic boy (1)

strongly resembles that of some of A's singing. Perhaps the clue to understanding the autistic child's reaction to words lies in part in an understanding of his reaction to music. For it is possible that, however detailed the examination of word production by these children may be, results may be difficult to obtain because we cannot divorce from our thinking a natural inclination to consider words only as a communicative means. Musical productions, however, which are not specifically communicative even for the average individual, may be for the trained observer easier to understand and throw further and revealing light on the psychopathology involved. In other words, musical production and reactions of autistic children may resemble more closely those of the normal adult, than their reactions and utilization of speech and words do. At the same time, however, many musical reactions are intimately bound with the psychopathologic process, and their investigation may prove fruitful.

Indeed, the vocal examples and reaction to music contain features that may well represent psychopathologic manifestations with which they are associated clinically. Thus, anxiety or fright seems expressed by the high-pitch level and pitch distortions under these conditions, the needless and quickening repetition of themes, sometimes at mounting pitch levels, and apparently frantic fragmentation or disintegration of the themes. Preoccupation and perseveration are also apparent. Obsessive-compulsive mechanisms are in addition suggested.

There is also considerable evidence that music represents a therapeutic approach, at least for the purpose of making contact with these children, and may actually contribute to improvement. On the other hand, in case C, with the improvement, the interest in music was lost. This observation suggests the possibility that utilization of music may not necessarily be beneficial, since it might result in furthering fixation at the infantile level.

SUMMARY AND CONCLUSIONS

Reactions to music of 3 autistic children, 2 of them identical twins, were studied. There is considerable evidence that unique musical reactions constitute a general finding

in autistic children. Investigations on 3 autistic children indicate that musical reactions are intimately bound with psychopathology; that reactions consist of a preoccupation and unusual absorption in music, a rote memory for melodies, a preference for singing over speech, a use of singing occasionally as a communicative means but more generally as an expression of an emotional state, and a response to music heard with rhythmical motions and easing of anxiety. There was also some evidence that improvement was associated with a decrease in intensity of interest in music. The possibility that the investigation of such musical reactions might provide further clues to the psychopathology involved, as well as new leads for therapeutic approaches, was discussed.

These preliminary findings indicate a need for further investigation of an important feature in the clinical picture of infantile autism, namely, the reaction to music. Such study might well lead to further understanding of the condition. Determination of exact differences in the reaction of autistic children to music and the reactions of normal children

would seem an important part of such a study. The possibility of a therapeutic application of music is suggested, but any statement as to its efficacy would be premature.

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A STUDY OF THE ELECTROENCEPHALOGRAM AS RELATED TO PERSONALITY STRUCTURE IN A GROUP OF INMATES OF A STATE PENITENTIARY¹

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Throughout the years early attempts to study the causes of criminal behavior placed the emphasis chiefly upon the hereditary anlage and upon physical factors. Later, influenced by Lombroso's (13) anthropological studies, the hypothesis of physical inferiority among criminals was generally accepted.

More recently, the introduction of psychobiology and the growth of genetic dynamic concepts in psychiatry have resulted in a complete reorientation within the field of criminology. Although this new orientation has produced a better understanding of the causative factors at work in criminal behavior, the problem is still a complex one and a great variety of factors that have contributed to the formation of criminal behavior patterns are still unknown.

In a previous study (12) an attempt was made to discover the outstanding personality factors among the population of a state penitentiary as demonstrated by the Minnesota Multiphasic Personality Inventory (MMPI) (7). In that study, based on the MMPI records of 600 consecutive admissions to a state penitentiary, it was demonstrated that the personality profiles of criminals convicted for crimes of violence differed from those of criminals convicted for nonviolent crimes, since the latter had much higher tendencies toward psychopathic traits than did the former group, which in general showed a greater tendency toward neurotic traits or other forms of poorly balanced personalities.

In the present investigation an attempt has been made to discover whether any relationship exists between type of electroencephalogram (EEG) record and the personality structure in a group of inmates of this same state penitentiary. The possibility of such

a relationship had been suggested by a number of previous studies, indicating that abnormal behavior may be related to abnormal EEG (6, 9, 17). This has been demonstrated in relation to mental disorders (6) and to delinquency in children (10, 11). In the criminal population the incidence of abnormal EEGs has been found to be lower than that of inmates of mental institutions, but higher than that of so-called normal population. Gibbs and co-workers (2) found that the inmates of a city jail showed a slight increase in abnormality in their EEG records, while Gottlieb and others (5) found many abnormal records related to psychopathic personalities. Diethelm and Simons (1) reported a similar increase in abnormal EEGs in a group of psychopaths. Stafford-Clarke and Taylor (16), furthermore, reported that the EEG of murderers who had executed their crimes with unpremeditated violence contained a significantly higher number of abnormal records than did those of murderers in whom the crime was premeditated and less immediately impulsive. Finally, psychomotor seizures have been thought to be the cause of some impulsive criminal behavior (3, 8), and Hill and his associates (8, 9) have discovered that theta activity at 4-6/sec., lying chiefly in the temporoparietal regions, is directly associated with paroxysmal rage.

MATERIAL AND METHOD

Since this study had to be limited in scope, only 100 of the 600 original inmates who were used for the study with the MMPI were given EEGs. All were males between the ages of 18 and 55 with IQs of 70 or above. The upper limit of 55 years was set because it was felt that in an older group arteriosclerotic disorders might complicate the cerebral picture. Inmates with IQs below 70 were excluded because in those cases the meaning of the MMPI might be different. Fifty of the 100 subjects were chosen from the group convicted of violent crimes, and 50

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from that of nonviolent crimes because of significant differences that had appeared in the previous MMPI study (12) and because the quality of aggressive or impulsive behavior was one that previous observation had shown to be significant in relation to the EEG. Inmates convicted of sex crimes, a separate category in the previous study, were excluded.

The MMPI records, generally speaking, fell into 3 groups, 2 of them distinctly outlined and the third somewhat mixed. The first group contained the MMPI profiles

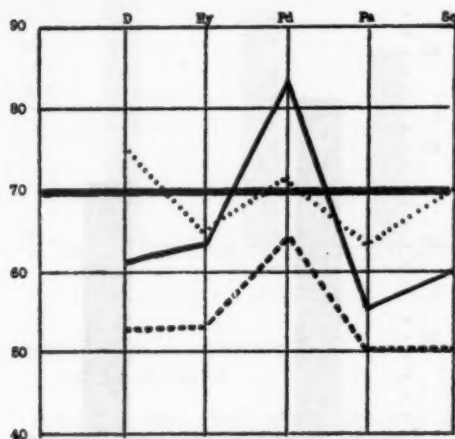


FIG. 1.—MMPI average according to the various diagnostic groups.

Pd Group ——— Normal Group - - - -
Non-Pd Group

with an abnormal high peak in the Pd scale indicating psychopathic deviation; the second group contained profiles with no abnormal peaks whatsoever indicating normal personality; and the third group contained those profiles showing abnormal peaks other than the Pd, indicating a personality deviation other than psychopathic.

One-third of the patients in both the violent and nonviolent groups were selected because of a high "Pd" score with no other MMPI peaks; another one-third in each group had a perfectly normal MMPI profile with no peaks whatsoever; and another one-third had elevations other than Pd on their MMPI profiles (Fig. 1).

The procedure in charting the MMPI profiles is to consider scores above 70 as ab-

normal for each specific trait. Thus, normal evenly distributed personality profiles show no peaks above the 70 level. Exceedingly high peaks appear in the Pd category in the majority of the cases in the first group, many of them being over 80. The third group, in which characteristics other than those of the psychopath predominated to a degree above the normal, is admittedly somewhat of a wastebasket, but is probably significant because of the unusually high peaks of various sorts that appear. Depression, hypochondriasis, hysteria, and schizoid tendencies had the majority of peak abnormalities here, and when occurring together in one person must in many instances indicate a high degree of neuroticism.

The subjects were told that the EEG test was not obligatory, but that, like their previous psychological tests, it might be for their own good. Some reassurance was necessary in a number of instances to the effect that this was not a machine that could "read the mind," "lie-detect," or "tell whether you were crazy." Under these conditions 5 subjects refused to take the test; the 100, together with many others who were being examined for routine reasons, underwent the procedure with no more or no less curiosity or anxiety than any other group of subjects "on the outside" might show under similar test conditions.

All subjects were questioned at the time of recording as to head injuries and various types of seizures and blackouts. A mimeographed sheet had been prepared for use in filling out these data. Other information was obtained later from the case records.

A Grass, 4-channel, model 3 EEG machine was used, which had been set up in an isolated and quiet room within the penitentiary. Records were made in the routine fashion, 8 needle electrodes being applied respectively to frontal, parietal, temporal, and occipital regions of each side. Hyperventilation was carried out for 2 minutes at the close of each test.

RESULTS

EEG ABNORMALITY

Thirty percent of the 100 EEG records were considered abnormal. This may be compared with the 5-10% usually found in

the normal population(4) and 50-60% among inmates of psychiatric hospitals(6, 11). Among the 2 groups, those committing violent and nonviolent crimes, this same ratio, namely 30% abnormal and 70% normal EEG, was found. Because of previous evidence suggesting that violent and unpremeditated actions might relate to paroxysmal EEG activity, the data with regard to crimes of violence were resorted. Instead of making the division between violent and nonviolent crimes from the conviction designations, differentiation was made from evidence in the case histories. Under this rearrangement all subjects placed in the violent group had shown some type of violent behavior in relation either to a previous crime, to the present crime, or to their conduct within the prison. Thus, for instance, a conviction of armed robbery, such as holding up a gas station, which had been considered a crime of violence, would not necessarily place the subject in a violent group unless he had struck or injured someone at the time. On the other hand, a subject convicted of larceny, which would appear as a nonviolent crime, might have had several previous convictions for assault, which would then place him within the violent group. However, when so rearranged, no difference was found either in the percent abnormal EEG records or in MMPI distribution.

EFFECT OF AGE ON EEG-MMPI RELATIONSHIP

The effect of age on EEG and MMPI relationship was considered of interest because the previous study with the MMPI had shown that the incidence of psychopathic deviates was much higher below the age of 30 years than above; and also because it had been found that abnormal EEGs occur more frequently in delinquent children than in adult criminals. When the data were arranged in this way, they showed that, among the 46 subjects 18 to 20 years old at the time of testing, 35% showed abnormal EEGs, while among the 54 subjects 21 to 55 years of age at the time of testing, only 26% showed EEG abnormalities (Fig. 2). This is a significant difference and one that is perhaps to be expected since age and instability of EEG are fairly directly related

in children, and may be related even in early adult life.

Because of the fact that behavior disorders in childhood show relatively high incidence of abnormal EEGs the same data were rearranged according to the age at the time of the first offense; that is, the age at which the subject first came in contact with

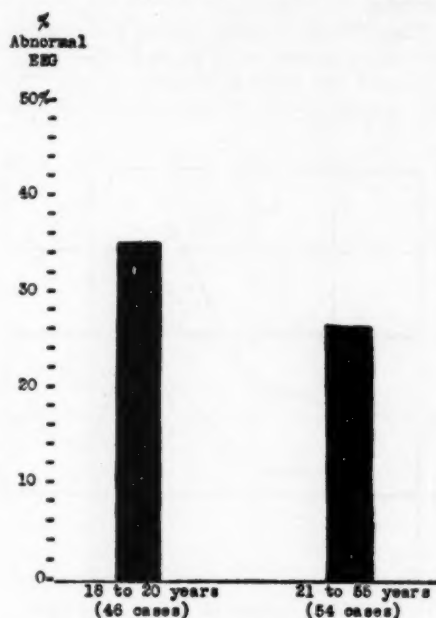


FIG. 2.—Effect of age on EEG abnormality.

the law. Nineteen of the inmates had had difficulties prior to age 15 and these showed 42% EEG abnormalities. Thirty-three were convicted for their first offense between the ages of 16 and 20, and showed 30% EEG abnormality, while the remaining 48 inmates whose first offense occurred after the age of 20 years had only 25% EEG abnormality (Fig. 3). Again there is a significant difference and one that is consistent with the already known facts about EEG and adolescent delinquency. However, in this group the correlation between the EEG abnormality and the MMPI profile appeared more significant. Of the subjects whose first crimes were committed before the age of 20, 42% showed a typical Pd profile on the MMPI while, of the subjects whose first crimes were committed after the age of 20, only 27% showed this Pd profile.

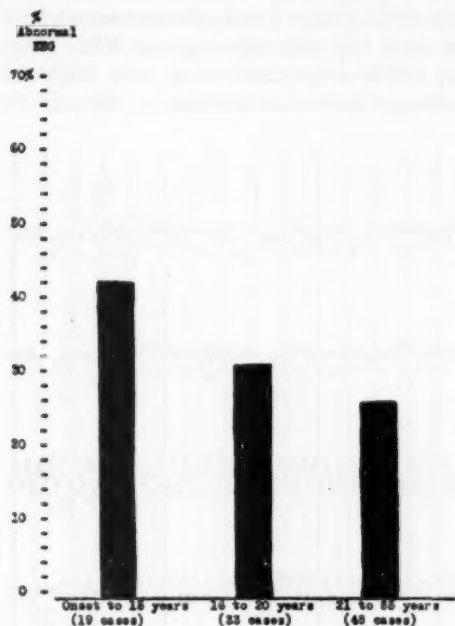


FIG. 3.—Relation of age at first crime to EEG.

CORRELATION OF EEG-MMPI DATA WITH SEVERITY OF CRIME

Assuming that good personality may be correlated with normal EEG, as had been suggested many times previously(17), an attempt was made to determine a relationship between EEG type and number of crimes committed by an individual. On inspecting the histories, it seemed in general to be true that those whose present conviction was their first had more stable marital, social, and work histories than did the multiple offenders. The group was, therefore, divided into 3 categories. The first consisted of 18 inmates who were guilty of only one major offense; the second of 15 inmates who had numerous arrests for minor offenses only; and the third of the remaining 67 inmates who had been convicted and imprisoned more than once for major offenses (Fig. 4). The percentage of abnormal EEGs was 17% for the first group, 20% for the second group, and 34% for the third group. It is of interest also that only 2 (11%) among the first offenders showed a typical Pd scale on the MMPI, while among

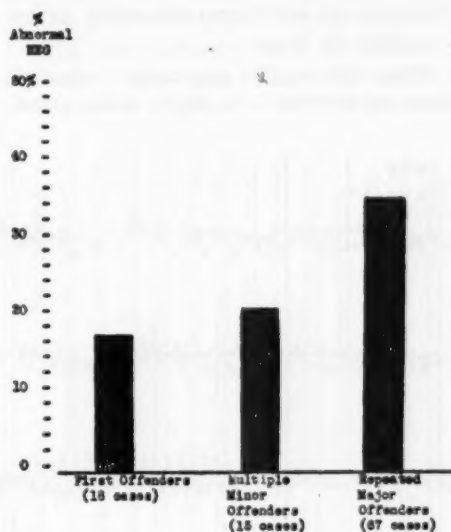


FIG. 4.—Relation of severity of crime to EEG

the group of minor offenders 7 (46%) had this typical Pd peak, and among the repeated major offenders 26 (39%) showed the high Pd scale demonstrating marked social instability.

RELATION OF ORGANIC BRAIN DISORDER TO EEG TYPE AND MMPI PEAK

Thirty of the subjects gave histories that indicated possible organic brain injury. Four of these were known epileptics (one post-traumatic and the others apparently idiopathic). The remaining 26 had all had blows on the head followed by unconsciousness, although none had shown residual organic defects. Duration of unconsciousness varied from several hours to 3 weeks. Type of injury varied from car accidents to war injuries, and the varied accidents of childhood. There were many others who had been knocked down by blows on the head or chin but these were not included in the "organic" group, the differentiation being made on the presence or absence of unconsciousness at the time of the insult. The results do not reveal more than the expected difference between the percent abnormality of EEG in the organic, namely 37%, and the non-organic, namely 28%.

SUMMARY OF EEG CHARACTERISTICS AS RELATED TO MMPI

When the EEG data were organized according to wave-form characteristics many

the entire group of 100 prisoners were found to have this pure alpha type of EEG (Fig. 5). This is probably more than might be expected in normal individuals, although on

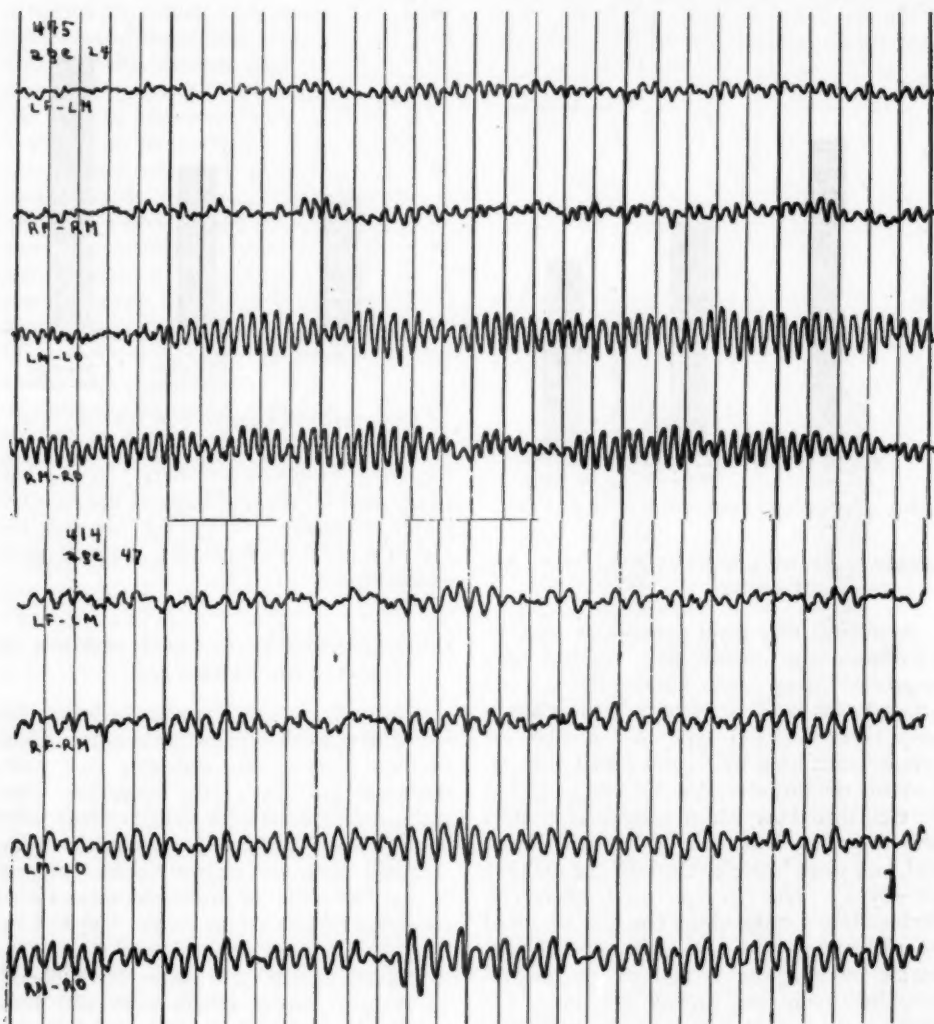


FIG. 5.—EEGs with high alpha activity.

of the records were found to contain practically pure alpha activity of moderate amplitude and marked stability. Such records are of the type that has been associated in the past with a particular kind of passive personality (15) and with individuals having peptic ulcer (14). Twenty-two percent of

the other hand according to Gibbs and Gibbs (4) 20% of normal records are "predominantly alpha." It may also be significant that 11 alpha records lay in the Pd category of the MMPI (31% of the total Pd records) and that only one appeared in an individual with possible organic cranial involvement.

Fourteen of the 22 records having 4-6/sec. activity of the type that has been associated with paroxysmal behavior(8) lay in the group with normal MMPI profiles

SUMMARY AND CONCLUSIONS

The data presented above are offered as indications of trends and possibilities in relating EEG types and personality traits.

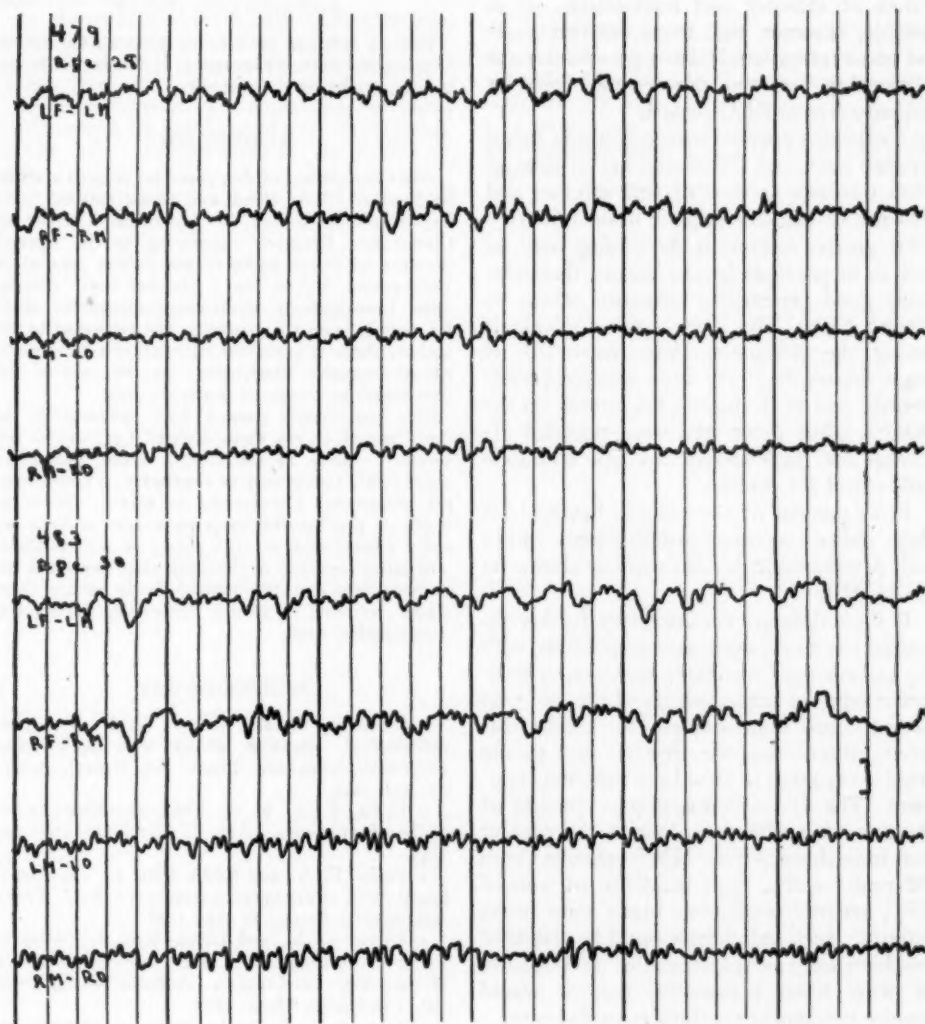


FIG. 6.—EEGs with 4-6/sec. abnormalities.

and comprised 35% of all records within this category. There was nothing remarkable or unexpected in the distribution of the low-voltage-fast records or of those having paroxysmal activity.

Since the total series comprises records from only 100 cases, it must be confirmed, if possible, by larger (and more well-defined) investigations.

An increase of abnormal EEGs in the

prison populations (30%) as compared to that of the normal population has been confirmed.

In the present series EEG abnormalities were found to be equally distributed between crimes of violence and nonviolence. It is possible, however, that more detailed study and observation would have produced some relationship between paroxysmal behavior and paroxysmal EEG record.

An expected positive correlation was found between abnormal EEGs and age at time of EEG test, age at time of first offense, and presence of possible organic brain injury.

Of greater interest is the finding here, as well as in previous investigations, that relatively good personality structure relates to normal EEG. The more stable individuals among the prisoners, those convicted of single crimes, had only 17% abnormal EEG records, and 11% showed Pd profiles on the MMPI, while those who were repeated offenders had 34% abnormal EEGs and 39% had typical Pd profiles.

Fifty percent of the records having high alpha indices occurred in individuals with a high psychopathic deviate score as shown on the MMPI.

If these data are confirmed by further investigation it may eventually be possible, with the assistance of such tests as above, to separate 2 types of transgressors of the law who have reached imprisonment for totally different, almost opposite, reasons and should from every point of view have different treatment. The first of these groups consists of the prisoners who according to the present tests have characteristic MMPI profiles (high Pd peak) and a high incidence of normal EEG records containing much pure alpha activity. Such individuals could be classified psychiatrically as "psychopaths" and because of their fixed personality pattern would require permanent maximal custodial care.

The second group contains mainly those with normal or neurotic profile on the MMPI, and these are found to have a higher incidence of abnormal EEGs. The unstable 4-6/sec. wave-forms and dysrhythmia in their records may indicate an underlying relative instability of personality usually associated with any one of several dynamic categories other than the fixed personality pattern.

These subjects, on the other hand, deserve careful therapy, both somatic and psychological, directed at their specific underlying psychopathology.

ACKNOWLEDGMENT

We are indebted to Warden John R. Cranor of Washington State Penitentiary at Walla Walla for his cooperation in these studies.

ADDENDUM

After completion of this paper we noticed a study by Stafford-Clark, Pond, and Doust entitled "The Psychopath In Prison: A Preliminary Report of Cooperative Research" appearing in the Special Number on Psychopathy of the British Journal of Delinquency, Vol. 2, No. 2, October 1951. Among other investigations, electroencephalographic studies were done on 165 prisoners, and according to the authors there is a positive correlation with electroencephalographic abnormality on the part of the psychopath as compared to the controls.

The psychopath showed EEG abnormality in the form of excess theta activity (4-7 cycles per second) mainly in the central areas, and these waves were interpreted as suggestive of physiological immaturity if occurring in adults. Other records of psychopaths show an excess of beta activity (faster than 14 cycles/sec.) as well as theta. The latter occurred in clinically alike cases and the authors described the individuals in whom these waves occurred as of the "charming, inadequate, psychopathic" type.

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PREMENSTRUAL TENSION: EEG, HORMONAL, AND PSYCHIATRIC EVALUATION¹

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Premenstrual tension is said to exist in such a large segment of the female population⁽²⁾ that it could almost be considered physiological. It has been estimated that about 40% of all women at some time or other suffer from this condition⁽¹⁾. When severe, however, the symptoms can be extremely disabling and may include the following: depression, irritability, temper outbursts, easy fatigability, sleeplessness, change in energy level, altered sex drive, backache, headache, nausea, vomiting, abdominal fullness, weight gain, aching of thighs, tenderness and swelling of breasts, and pedal edema. It is of interest to the psychiatrist that alteration in mood and drive are here so conspicuous. Psychiatrists have used the term "menstrual psychosis"⁽³⁾, and it is within the experience of many that depressive psychoses may be apparently precipitated or at least aggravated at this time in the hormonal cycle of women. It thus seemed to us that further investigation of the psychological aspects of this disturbance was indicated in order to determine whether or not there is correlation between these symptoms and some specific personality configuration. It also seemed possible that this might be a means of increasing our knowledge of affective disorders.

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Most of the theories that have been advanced to explain the syndrome of premenstrual tension are concerned primarily with a pathologic endocrinologic imbalance, particularly of the estrogen-progesterone level. Therapy based on such research, however, has been singularly unrewarding in terms of predictable results in large numbers of patients. It is also known that the symptoms of premenstrual tension cannot be accounted for on the basis of generalized water retention alone, inasmuch as some women with severe symptoms show no clinical evidence of this; edema occurring as a part of other pathological processes is not associated with these symptoms; and there is alteration of water metabolism in the premenstrual period in normal controls also⁽⁴⁾. In the literature, little attention has been directed to the psychodynamic aspects of premenstrual tension, although reference to this condition has been made in studies concerned with the changes in psychic phenomena during the normal menstrual cycle⁽⁵⁻⁷⁾. It was felt that, by simultaneous physiological and psychiatric observations on a group of subjects with premenstrual tension and on a group of controls, some worth-while correlations might become possible. A daily measure of endocrine activity was essential for such a study. An electroencephalographic investigation was included to determine whether or not behavioral manifestations might reflect directly alterations in the cerebral neurophysiology so measured. Only 2 studies of the EEG during the menstrual cycle are currently available in the literature, one⁽⁸⁾ of 4 and the other⁽⁹⁾ of 11 individuals. In neither of these studies were the EEG's hormonally related to the phases of the menstrual cycle, although the observation was made that there was some disturbance in frequency regulation occurring at the "mid-menstrual period" and that the brain activity became slower after the beginning of menstrual flow. A preliminary study of our own in which 18 women were followed through 2

menstrual cycles with EEG recordings taken with and without intermittent photic stimulation showed the necessity for endocrinologic control. In this initial study only random variations in frequency and amplitude of the electronically analysed EEG were found when the records were grouped as to "first 3 days after bleeding," "14th-15th day of cycle," and "week before flow." With the opportunity presented by the present study for a more accurate determination of the menstrual phase in each subject it seemed worth while to repeat these observations even though, with an *N* of 10, the results obtained could be considered only preliminary.

PROCEDURE

A questionnaire study was made of 127 student nurses. This group consisted of all the students in the second and third year classes of a school of nursing. The subjects ranged in age from 18 to 35. The questionnaires were completed following a brief introductory discussion by one of us (W.L.), who stated the nature of the subject and gave some explanation of the terms used in the questionnaire. By means of this form, which was completed in detail by all subjects, the following points were investigated: (1) complete menstrual history of subject, including any symptoms related to menstruation and treatment for these; (2) pelvic disease in subject; and (3) symptoms related to menstruation in members of subject's family.

From this group of 127 nurses 10 subjects were selected for careful study. Five of these were controls and the other 5 had symptoms of premenstrual tension. They were selected at random with the exclusion only of those with a history of organic pelvic disease or a menstrual irregularity so extreme as to render our investigations impossible. Subjects ranged in age from 18 to 22. The study of each subject covered at least 2 complete menstrual cycles. Pelvic examination and BMR were done on each subject. Daily vaginal smears were made during the first month of study, and for 3 to 5 days during the second month to include the estimated day of ovulation. These smears were obtained by the subjects themselves after instructions in the proper technique. Urine

gonadotropin titers were measured for 3 days at the time of ovulation (as previously determined by the vaginal smear technique).

All subjects were seen in 8 interviews, each of approximately 1 hour's duration. These were scheduled so that the subjects were seen at least once in each of the following phases of the menstrual cycle: (1) the 24 hours postbleeding, (2) the time of ovulation (within 24 hours), (3) the premenstrual period, and (4) the first day of bleeding. It was felt that in this way the interviews could serve a twofold purpose. They would afford an opportunity for direct observation by the examiner of the subject's behavior at the time, and would also enable the examiner to come to some conclusion as to the general personality configuration of the subject. All interviews were conducted by the same psychiatrist (W.L.). An attempt was made to exclude, as much as possible, any element of therapy from the examiner-subject relationship in the interviews. Interviews were standardized only in that an effort was made to obtain a complete menstrual history and to investigate the following areas of the subject's life and personality: (1) family background and development, (2) interpersonal relationships, including relationship of subject to parents; (3) psychosexual development, (4) general health of subject, and attitudes of subject and parents toward health and disease, (5) physical stamina and general activity level, (6) reaction to stress or crises, and (7) pain threshold.

EEGs were recorded on each subject in the 24 hours postbleeding, at the time of ovulation (within 24 hours), and in the premenstrual period (3 days prebleeding and 1 day prebleeding). A Grass model II 4-channel electroencephalograph was used with scalp-to-scalp recording by means of needle electrodes from the left frontoparietal and right and left parieto-occipital regions of the head. At least 4 recordings were made on all subjects and a total of 72 records was taken on the entire group. In each instance recordings were made for 10 minutes while subjects were at rest with eyes closed. With eyes open they were then subjected to photic stimulation by means of light from a tungsten-filament bulb that produced a 30-inch circle of light (200 foot candle intensity)

on the subject's side of a flashed opal glass screen, placed 6 to 12 inches from the face. The light was interrupted by a pendulum type episcotister at 22 different frequencies from 2 to 30 flashes per second. A modified Walter-type electronic brain wave analyser quantified the response from the right parieto-occipital tracings. Measurement of the analyser pen deflections served to provide data used in computing the power at each of the frequencies of brain wave response studied. The subjects were varied as to the phase of the period at which their first recording was done so that any factor of alpha diminution as a result of the emotional tension from the initial recording did not have to be considered as producing a constant variation in the group results.

RESULTS

RESULTS OF QUESTIONNAIRE SURVEY

The mean age of the 127 nurses was 20.3 years. The mean age of menarche was 12.5 years. Only 4 subjects had a history of pelvic disease. Ten were always irregular in onset of their periods and 70 were sometimes irregular.

With dysmenorrhea defined as pain starting just before or with the onset of the menstrual flow, 99 (78%) subjects stated that they, at least sometimes, suffered from such symptoms and 66 (50%) usually or always had this complaint. Seventy percent of girls with dysmenorrhea had a family history of dysmenorrhea (this figure includes both the girls who checked "sometimes" and those who checked "always" on the questionnaire). Only 43% of the group with no dysmenorrhea had such a positive family history. This is significant at the .01 level of confidence. On the other hand no relationship was found between such a positive family history and the occurrence of premenstrual tension.

Ninety-two subjects (73%) had symptoms of premenstrual tension, as shown in Table 1. It is of significance that psychiatric symptomatology (*i. e.*, depression, irritability, or temper outbursts) occurred singly or together in 78 (85%) of the subjects with premenstrual tension.

RESULTS OF PSYCHIATRIC INVESTIGATION

A comparison was made of the anamnestic data obtained from the 5 subjects with premenstrual tension and the 5 control subjects (Table 2). These data were compiled at the end of a series of one-hour interviews. An opportunity was provided in this way to confirm data obtained initially. It was felt that

TABLE 1

SYMPTOMS OF PREMENSTRUAL TENSION IN 127 GIRLS

(Total number of subjects with symptoms—92)

1. Weight gain.....	18
2. Backache	60
3. Abdominal fullness.....	66
4. Aching thighs.....	17
5. Headache	28
6. Nausea	10
7. Vomiting	3
8. Tenderness of breasts.....	55
9. Swelling of breasts.....	40
10. Swelling of feet.....	2
11. Increased sexual drive.....	9
12. Depression	54
13. Increased pep or energy.....	11
14. Temper outbursts.....	16
15. Irritability	62
16. Easy fatigability.....	46
17. Sleeplessness	4

cooperation and rapport in all cases were good, and that in all probability the information obtained was accurate. All interviews were conducted by a woman psychiatrist, and there was no undue reticence on the part of the subjects in giving the information sought.

From Table 2 it can be seen that there was no characteristic difference in developmental history and background between the 2 groups of subjects. The reaction to the onset of menstruation varied from girl to girl in each group but no one reaction characterized either group and there was no significant difference in the types of reaction between the 2 groups, although 2 of the premenstrual tension subjects had been prepared by mother for the menarche whereas 4 of the controls had received such preparation. A mother of one of the subjects in the control group was completely incapacitated by dysmenorrhea, whereas 2 of the mothers of subjects with premenstrual tension had irritability and headache with their menstrual periods. In

considering the subjects' reactions to stress it was found that 4 of the girls with premenstrual tension showed untoward reactions to stressful situations, a finding in only 2 of the subjects in the control group. Here considered as stressful situations were the following: separation from home and from significant persons in subject's life, uncer-

acted to other types of stress. There was no marked difference between the 2 groups in regard to sexual development, attitudes toward sexual behavior, or personal history of sexual experience. All subjects participated in various heterosexual activities but none of them had had sexual intercourse. From the information available, there appeared to

TABLE 2

SUMMARY OF ANAMNESTIC DATA OBTAINED FROM SUBJECTS WITH PREMENSTRUAL TENSION AND CONTROL GROUP

	In 5 subjects with no symptoms	No.	In 5 subjects with premenstrual tension	No.
Menstrual History				
Menarche	At age 13 (mean)		At age 12.5 (mean)	
Regularity	Entirely regular.....	4	Entirely regular except for 2 skipped periods.....	1
	Varied less than week.....	1	Varied less than week.....	3
			Varied more than week.....	1
Preparation	By mother.....	4	By mother.....	2
Reaction to first period.....	Pleased, meant maturity.....	1	Pleased, meant maturity.....	1
	Angry, meant "girl".....	1	Frightened	1
	Concealed from mother.....	2	Accepted "normal nuisance".....	1
	Accepted—no reaction.....	1	Accepted—no reaction.....	2
Symptoms in mothers.....	Dysmenorrhea, disabling....	1	Irritability, headache.....	2
General health.....	Very good.....	5	Very good.....	5
History of fainting.....	Twice	1	Three times.....	1
Parents' attitudes toward illness	Father became emotionally disturbed	1	Mother showed periodic ob- sessive preoccupation.....	1
Attitude toward career.....	Want marriage and career... 4		Want marriage and career... 4	
	Wants career only.....	1	Wants career only.....	1
Untoward reaction to stress....	Anxiety with responsibility and uncertainty.....	1	Depression, with separation Anxiety, with criticism....	1
	Depression, with lack of goals and uncertainty.....	1	Hostility and crying, with criticism	1
			Anxiety, with responsibility Anxiety and depression, with criticism.....	1
			Anxiety, with responsibility..	1
Pain threshold.....			Faintness with venipuncture..	1
Difficulty in area of inter- personal relations	With parents and examiner... 2		With parents, peers, and ex- aminer	1
Psychosexual development....	With peers.....	1	Sex not discussed in home... 3	
	Sex not discussed in home... 2			

tainties and changing demands, failure to reach desired goals, criticism from others, positions of responsibility, and emergencies arising in hospital work. Thus, more of a difference between the 2 groups appeared to be manifested in this area than in other areas. Because of speculation as to the significance of pain threshold in premenstrual tension an attempt was made to elicit information as to each subject's reaction to painful stimuli, and it was found that only one subject, in the premenstrual group, gave indication of over-reaction (in this case the stimulus involved venipuncture). This same subject overre-

acted to other types of stress. There was no marked difference between the 2 groups in regard to sexual development, attitudes toward sexual behavior, or personal history of sexual experience. All subjects participated in various heterosexual activities but none of them had had sexual intercourse. From the information available, there appeared to

be no essential difference in parental attitudes in this sphere or in sexual education in the home, although there was a lack of free discussion of sexual topics in the homes of 3 subjects with premenstrual tension and in the homes of 2 of the controls. The interviews were purposely arranged to coincide with the phases of the menstrual cycle during which EEGs and endocrinologic studies were being made, and hence it was possible to evaluate the mood and behavior of each girl within 2 days after bleeding, at the time of ovulation, premenstrually, and on the day of bleeding. At the end of each

hourly interview the examiner attempted to rate objectively each subject in terms of mood, activity level, and self-expression, on the basis of observations of the subject's interview behavior and from the subject's account of her behavior during the intervals between interviews. Careful attention was paid to the various facets of personality functioning in each instance. Some 25 items were separately rated on a personality inventory scale but for purposes of comparison these observations could best be summarized under the categories of mood, activity level, and assertiveness, as shown in Table 3. From

and frustration, were those of subjects with premenstrual tension. The only subjects who reported no dreams or just one dream were controls, and the one dream in this instance was an uncomplicated heterosexual dream. There was much less consistency in the character of the dreams reported during the various phases of the menstrual cycle among the subjects with premenstrual tension. For example, throughout the study one subject reported dreams that were alternately aggressive heterosexual and passive receptive in type. Another subject in the tension group apparently repressed any dreams showing

TABLE 3

OBSERVED CHANGES IN MOOD AND BEHAVIOR IN SUBJECTS WITH PREMENSTRUAL TENSION AND IN CONTROLS AT FOUR REPRESENTATIVE PHASES OF THE MENSTRUAL CYCLE

	Postmenstrual (1-2 days) I		Ovulation (24 hours) II		Premenstrual week III		Menstruation (first day of flow) IV	
	Controls	PMT's	Controls	PMT's	Controls	PMT's	Controls	PMT's
Mood								
Euphoric	0	0	0	0	0	0	0	1
Normal	5	4	5	3	5	1	5	2
Depressed	0	1	0	2	0	4	0	2
Activity level								
Hyperactive	1	2	1	2	3	1	1	2
Normal	4	2	4	1	2	2	4	2
Hypoactive	0	1	0	2	0	2	0	1
Assertiveness								
Hostile, aggressive	0	0	0	0	0	3	0	1
Normal	5	1	5	2	5	2	5	2
Subnormal	0	4	0	3	0	0	0	2

this it can be seen that the premenstrual tension subjects showed greater deviation from the normal in mood and activity level not only premenstrually but throughout the entire cycle. This group also regularly showed a greater amount of subnormal assertiveness and demonstrated hostile aggressiveness during the premenstrual period.

Dream material was also studied, inasmuch as there is some evidence to indicate that correlations between psychodynamic processes and the different phases of the menstrual cycle are reflected in dreams (5,6). Although there was no attempt to make a detailed analysis of the dreams reported, some general observations were possible. The total number of dreams reported by the tension subjects by far outnumbered those of the controls. Also, the more violent and detailed dreams, with obvious elements of anxiety

anxiety related to heterosexual drives, and with the exception of one dream on the 12th day of the cycle all her dreams occurred in the last half of the cycle.

On the other hand, the dreams reported by the control subjects appeared to follow a much more consistent pattern—dreams reflecting passive receptive tendencies occurring in the postmenstrual period, and those reflecting heterosexual drives with related conflicts occurring in the premenstrual period. These preliminary findings do not confirm the observations of Benedek and Daniels. However, because of the small number of subjects studied, no definite conclusions can be drawn from our findings. In this study we were unable to demonstrate that changes in psychodynamic processes as reflected in dreams are consistently correlated with hormonal changes.

RESULTS OF ELECTROENCEPHALOGRAPHIC INVESTIGATION

Figure 1 shows the profiles of the resting EEG for all 10 girls. From this figure it can

(Table 4), by a method of rank difference (11) that makes no assumption as to the distribution of alpha in the population, revealed no statistically significant trend for

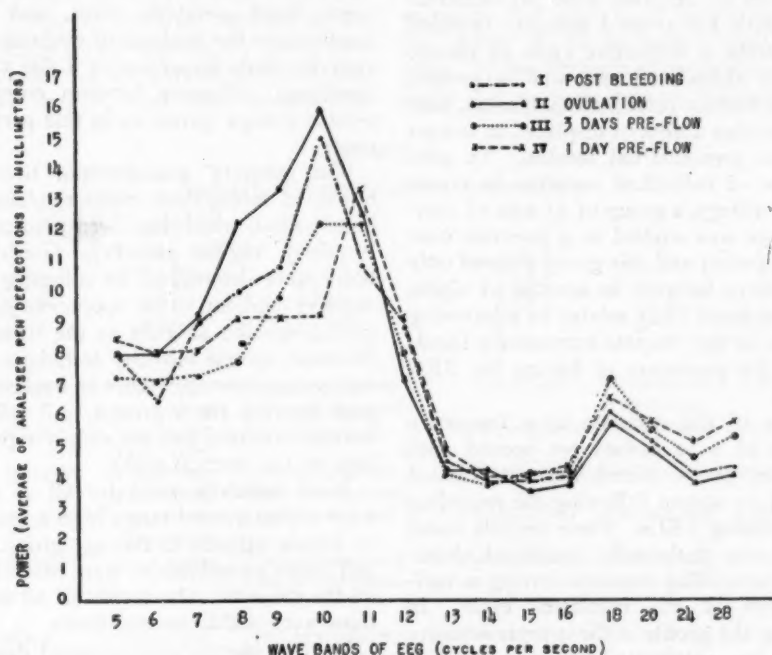


FIG. 1. Profiles of EEG for 10 subjects.

TABLE 4

DISTRIBUTION OF EEG ACTIVITY IN SUBJECTS WITH PREMENSTRUAL TENSION AND THEIR CONTROLS AS MEASURED BY AN ELECTRONIC BRAIN WAVE ANALYSER

Total alpha activity	Phases*				Probability of differences among phases I-IV	Probability of differences between phases II and IV
	I	II	III	IV		
Controls	61.1	73.5	48.3	44.9	.07	.07 †
Exp. group	52.3	49.8	54.7	57.3	not significant	not significant
Total	56.7	61.6	51.5	51.1	not significant	not significant
8-10 c.p.s. activity						
Controls	39.5	51.3	30.6	26.9	.04	.07 †
Exp. group	34.3	32.7	30.6	30.7	not significant	not significant
Total	36.9	42.0	30.6	28.7	not significant	.01

* Phases of menstrual cycle designated as I, II, III, IV correspond to those in Table 3.

† Phase II higher than phase IV in all 5 cases but number of cases too small to establish significance.

be seen that there is a definite trend for the greatest amount of alpha to occur with ovulation and the lowest amount to occur premenstrually. Furthermore, the peak alpha frequency shifted from 10 to 11 premenstrually. Studies of the 2 groups of subjects

alpha change. Comparing the shift from the time of ovulation to the day before menstruation, however, the drop that occurs in the amount of 8-10 per second activity is significant for the total group at the 1% level of confidence. Nine of the 10 women in

our study showed a lowering of activity in this 8-10 cycle-per-second band from the time of ovulation to just prior to onset of bleeding. The one exception occurred with one of the women with premenstrual tension. Comparison of subjects with premenstrual tension with the control subjects revealed that, whereas a suggestive cycle of change within the alpha band may well be present in women without premenstrual tension, such a cycle is either absent or displaced in women who have premenstrual tension. To gain some idea of individual variation in repeat EEG recordings, a group of 11 men of comparable age was studied at 4 intervals over a 3-week period and this group showed only a progressive increase in amount of alpha, which was most likely related to a lessening of tension as they became increasingly familiar with the procedure of having the EEG recorded.

Studies of the response to a frequency spectrum of 2-30 flashes per second with intermittent photic stimulation were carried out in all 10 women following the recording of their resting EEGs. These records failed to reveal any statistically significant alteration in susceptibility to photic driving at various phases of the menstrual cycle. In comparing the profile at the 4 representative points in the cycle for all the girls together, it was seen that there was a slight tendency for an increase in response to faster frequencies of flashing light that seemed to occur just prior to the onset of menstruation, a time, as we have shown above, when the resting EEG tended to show an increase in the frequency of alpha activity. One of our subjects who showed a tendency to myoclonic reaction during photic stimulation showed an increase in severity of the clinically observable myoclonic reaction as the recordings approached the onset of the menstrual flow, although no gross change in the electroencephalogram accompanied this. This may be of interest in relation to the subject of premenstrual epilepsy.

By clinical interpretation, the EEGs of the subjects with premenstrual tension could be classified as 2 clearly normal and 3 borderline (S_1 , LVF, and Mixed $F_1 S_1$), whereas in the control group there were 3 clearly normal EEGs, one S_1 , and one F_1 .

RESULTS OF ENDOCRINOLOGIC INVESTIGATION

A basic gynecologic endocrine evaluation was attempted for both the control and tension groups. Pituitary, thyroid, and ovarian functions were investigated. Gonadotropin titers, basal metabolic rates, and vaginal smears were the methods of evaluation. It is apparent from inspection of Table 5 that no significant difference between control and tension groups shows up in this part of the study.

The subjects' gonadotropin titers were measured during their ovulatory phase (a 72-hour period, which had been predetermined by daily vaginal smears). Gonadotropin titers were determined by collecting 3 consecutive 24-hour urine specimens and subjecting specific aliquots to the usual ultrafiltration, mouse bioassay technique. There was no apparent difference in ovulatory titer peak between the 2 groups. All fell within normal variation and are simply reported as high or low normal peaks.

Basal metabolic rates for all 10 subjects were within normal range for a cross section of female subjects in this age group. Pelvic and breast examinations were carried out on all the subjects. The results of all examinations were within normal limits.

Vaginal smears were obtained daily from the time of cessation of menstrual flow until subsequent onset of menstruation. During the ovulatory week, the subjects obtained smears at 12-hour intervals. A rough evaluation of estrogen production together with determination of preovulatory or premenstrual peaks was possible, subsequent to staining by Shorr technique and evaluation. It was also possible to delineate the luteal effects subsequent to ovulation. The ovulatory period of all subjects could be defined within a 24-hour margin of error. No significant variation in estrogen or progesterone production was found between control and tension groups, and apparently ovulation was occurring regularly in all subjects.

It can be definitely stated that the endocrine function in all 10 subjects, comprising both control and tension groups, is within normal limits, and there is no demonstrable distinction between the 2 groups in this respect.

DISCUSSION

Our questionnaire survey has confirmed the common occurrence of premenstrual tension and, at least among student nurses, $\frac{2}{3}$ of the female population have such complaints. From the evidence obtained in the detailed study of 10 subjects, no strong case could be made for the psychogenesis of premenstrual tension, and such suspiciously

Our observations showed that just premenstrually the EEG in the control group showed a decrease in alpha and slight comparative gain in rapid activity thereby. This fact may be a partial explanation for observation that more rapid activity is seen in the resting EEGs of women than in men (10). If one attempts to explain the drop in alpha that we have seen on the basis of in-

TABLE 5
RESULTS OF ENDOCRINOLOGIC INVESTIGATION

Case number	Frequency and duration of menses	24-hour period of ovulation (observation of 2 cycles)	Degree of cellular estrogen stimulation	Degree of cellular progesterone stimulation	Range of gonadotropin titers	BMR (average)	Premenstrual weight change in pounds
Control group							
1	30X5	16am-16pm 16am-17am	Low preovulatory Low premenstrual	Slow effect	High normal (15th day)	-18	-1
2	28X7	14am-15am 14am-15am	Low throughout	Rapid effect	Low normal	-19	+4
3	35-42X6	17pm-18am 17pm-18am	Low pre- & postov. High premenstrual	Rapid effect	Low normal	-21	+6
4	25-30X6	15pm-16am 13pm-14am	High throughout	Rapid effect	Animals died	-11	+1
5	28-30X6	15am-15pm	High preovulatory Low premenstrual	Rapid effect	High normal (14th day)	-17	+2
Tension group							
1	28X4	13pm-14am 13pm-14am	High preovulatory Low premenstrual	Rapid effect	High normal (11th day)	-7	+5
2	28X4-5	13am-13pm 13am-13pm	Low preov. high postov. High premenstrual	Rapid effect	Low normal	-17	+2
3	21-26X3-4	13pm-14am 12pm-13am	High ovulatory Low premenstrual	Rapid effect	High normal (10th day)	-12	+1
4	28-30X5-6	20am-22am 19am-20am	High ovulatory Low premenstrual	Slow effect	High normal (18th day)	-7	-2
5	28-30X4	11am-12am 11am-11pm	Low preov. high postov. Low premenstrual	Rapid effect	Mod. high normal (12th day)	-14	0

etiologic areas as (1) mothers with menstrual symptoms, (2) faulty preparation for menstruation, or (3) abnormalities in psychosexual development were not *sine qua non* conditions for the occurrence of symptoms of premenstrual tension. An assessment of data from psychiatric interview material, however, left us with the impression that as a whole the girls with premenstrual tension showed greater fluctuations in mood and activity level throughout their cycles as well as in the premenstrual period. In general, these girls also were less assertive but in the premenstrual period became more aggressive than the controls.

creasing "tension" or agitation, an effect that is well known upon the alpha, one would look for greater changes in girls with premenstrual tension than in the controls. This is not the case, however (Table 4), as the normals show a greater lowering effect. However, the premenstrual tension subjects start with a lower alpha and hence have significantly lower alpha at the time of ovulation.

The inclusion of 5 subjects with premenstrual tension in this sample of 10 would not preclude a more general application of these observations in regard to electroencephalographic findings in women if one accepts the statements that almost half the

female population in general has premenstrual disturbance.

Evaluation of endocrine activity in these subjects demonstrates complete lack of individual pattern between control and tension groups. Although both groups are too small to allow for definitive conclusions in regard to hormonal activity, the basic lack of significant point variation tends to contradict the concept that estrogen-progesterone imbalance is necessarily associated with the syndrome of premenstrual tension.

No attempt was made in this study to make accurate determinations of water metabolism, but if one uses weight change as a rough criterion, water retention could be said to occur more often among the controls than in the subjects with premenstrual tension.

CONCLUSIONS

Electroencephalographic, hormonal, and psychiatric investigations of a small number of subjects with and without premenstrual tension have revealed the following: (1) no indication that the behavioral manifestations of premenstrual tension reflect directly alterations in the cerebral neurophysiology so measured, (2) endocrine activity within normal limits in all subjects, with no demonstrable distinction between subjects with premenstrual tension and controls, and (3) no evidence that would substantiate a theory of psychogenic etiology for premenstrual tension.

However, there appeared to be some definable differences in behavior other than the premenstrual manifestations differentiating the 2 groups. The subjects with premenstrual tension showed more marked emotional lability throughout their cycles, and in general were less assertive individuals.

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EMOTIONAL ASPECTS OF REHABILITATION¹

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It is my opinion that there are no medical stumbling blocks in the rehabilitation of a patient other than those created by the patient's emotional problems. Where the disability has not produced a major emotional conflict, and where emotional pathology did not exist before the disability, patients will be rehabilitated, or better, will rehabilitate themselves. The handicap in rehabilitation consists of how a person feels about being disabled, together with the emotional value in staying disabled. In the first place it alters the patient's concept of himself as a person—physical configuration, adequacy of performance. Certain types of disability—blindness, deafness, paraplegia, etc.—eliminate important previously acquired methods for meeting basic emotional needs through sublimation and other mechanisms or prevent their acquisition. This additional burden of inadequacy, real or neurotic, may be sufficient to create psychic pathology where none was apparent before.

The other factor has to do with secondary gain from remaining disabled. How the patient influences others about him determines what he gains by remaining disabled. He may get an equivalent of love that he never felt before, by having others wait on him. Similarly, if his disability requires much service from many people, he becomes the center of attention—perhaps something he never was able to achieve before. He may become such a burden upon those about him that he learns he can control and punish them by staying sick. Responsibility and supporting others may have become unconsciously irksome to the patient prior to dis-

ability. Disability creates a state of being supported by others for a change and of being relieved of responsibility. If this proves sufficiently pleasant, the patient will develop resistance to giving up his disability.

Because these processes may not be fully conscious doesn't make them less real. In such process the secondary gains of staying disabled are always present. We all have needs for love and attention, desires for dependency, feelings of hostility. The basic processes of our development make this so. The presence or apparent lack of motivation for recovery depends on the unfulfilled degrees of such need, a degree that varies in all of us.

The aspects of recovery that supply the same needs counterbalance these values of remaining disabled. Recovery may supply love, attention, respect, and other equivalents. We can control and dominate others by becoming self-sufficient. By becoming independent we can have our wants cared for—the paradox of creating the pleasures of dependency by being independent. We clarify the problem by stating that there is positive motivation to stay disabled, as well as motivation to get well. Rehabilitation takes place when the latter is greater than the former. Where a problem in motivation exists, the motivation to stay disabled is already greater. This explains the difficulty in "motivating such patients to get well." Perhaps this will explain why there can be no simple answer to the question, "How do you motivate a person to get well?" if we are thinking of 50,000 disabled coal miners who "have no motivation to be rehabilitated" (1). Each such man has his own set of needs, a different set of secondary gains from his disability, and a different set of values he derives from being independent and gainfully employed.

A 45-year-old white man was hospitalized for over 10 years for "epilepsy" (according to the patient) or hysteria (actual hospital diagnosis). To the patient's wife this meant continuation of his pension, control of the patient and his money as his legal guardian, and use of these powers to dominate, threaten, and coerce the patient. As the wife of a "helpless" patient, she could and did dominate vari-

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ous civic groups interested in the hospital and its patients. Through these groups she could bring pressure on the hospital management. Whenever the patient was sufficiently well to be considered for a discharge, he would have a preliminary visit at home, during which he would have recurrence of seizures, and indulge in alcohol. This was used by the wife as "proof" that he dare not be out of the hospital.

To the patient hospitalization meant being away from an aggressive, punishing wife, and remaining in an atmosphere of acceptance and consideration.

When the patient became aware that he could change all this by taking a job, living out of the hospital but away from his wife, and not having "seizures," rehabilitation became possible. He first was convinced that his guardianship could be revoked, giving him control of his funds. This led to his feeling he could then control his wife instead of the reverse as of old. More important, by removing his wife's power he could assert himself and repay old indignities.

He not only took a job but removed his 16-year-old son from his wife's domination by getting the son a job under him. This arrangement had continued for over a year when last heard from. There were no more "seizures."

Psychotherapy, if it can be called such, consisted only of pointing out the advantages of being independent in relationship to the guardianship and full control over himself—reorienting motivating forces.

Any physician can give similar examples in all fields of chronic invalidism.

The problem of motivation is not one of a therapist motivating a patient, but rather of the patient being helped to reorient or regroup his motivating values. If the problem is based on such deep psychiatric pathology that intensive psychotherapy is necessary, it becomes a major undertaking for a psychiatrist. This is why these major problems do not "clear up" in a few "treatments."

But patients "without motivation" can be "motivated." They can be helped to a realistic reappraisal of their disability and remaining assets—a reorientation of how they feel about themselves as persons with disabilities. This requires changing values.

The patients must be helped to see that the emotional values derived from fuller function are greater than the secondary gains of being disabled. They must be reminded of the values of independence, and that there are disadvantages in dependency as well as advantages. Bringing to their attention that a "handicapped" person deservedly receives greater respect for overcoming a handicap opens up a wide vista of love and attention that is the patient's for the taking. Then,

too, supplying the patient's emotional needs without any relationship to the presence or absence of disability eliminates these values from consideration. These measures can only be effective if based on what these emotional values mean to the individual patient. Each patient will have different standards, different symbols, and different ways of interpreting these generalities, based on his individual experience and his cultural pattern. Only the people who know this individual patient intimately and who also know the psychological processes at work can accomplish the task of helping him motivate himself.

The consideration of the psychic structure indicates a wider approach to rehabilitation of patients with neurologic, orthopedic, cardiac, and other structural disabilities. Most of these have had adequate psychological equipment prior to their disability. This suggests another approach, that of the prevention of secondary psychological disability. Psychological rehabilitation begins with the onset of illness in all cases. In some—perhaps with the 50,000 miners—prophylactic changing of cultural psychological values may be indicated.

The phenomenon of regression must be considered. People with no psychological disability, given certain circumstances, can regress to less favorable patterns of behavior. Even people more strongly motivated for achievement can permit dominance of existing emotions for not achieving. The cardiac put to bed may be constantly reminded by his physician, nurse, and family that he is no longer capable of working. By their actions he learns they will care for him. Preventive measures would dictate that they emphasize that he will have to work *differently* than he did before and that they see that he does everything possible for himself during every phase of his illness. The patient with tuberculosis is forced to give up the motivating factors for independent function, while the motivating factors for staying disabled are strengthened. Is this necessary? From the beginning these patients can be preparing themselves for return to function, instead of emphasizing their present inability to function as they did before their illness. Bernard Daitz(2) reports an ex-

ample of a tuberculosis patient fully readied for employment on discharge from a hospital, put back into 6 months of inactivity because his next physician followed the dictum that tuberculosis patients shouldn't work soon after leaving the hospital. Six months could dissipate all the motivating factors for employment so carefully nurtured during hospitalization. How many families—and doctors—as a matter of routine simply state, "Take it easy for a while," after hospitalization and illness, without careful thought whether "taking it easy" is good or bad?

Industry, in its safety campaigns, constantly stresses that disability is synonymous with further uselessness. Preventive psychiatry would indicate that this prepares the ground for motivating a patient to stay disabled once injured. It would be better to stress that disability might require the learning of a new job—making disability still consistent with continued employment.

Preventing the psychological impact of the primary meaning of disability is of another order. Doing something about the meaning of disfigurement, about the meaning of the loss of receptive or expressive functions, is in some measure a sociologic problem. It is similar to the basic problem of the aged. It requires changing concepts within the individual, concepts that are built into him throughout his development. His concept of disfigurement is based on what his social stratum has taught him to believe.

To counteract the effects of loss of receptive and expressive functions also entails sociologic changes. These psychological effects cannot be prevented. They can be minimized by providing the individual with an abundance of such other functions that the loss of one will matter less. The person with many wide interests will suffer less when some of these interests are taken away by blindness, deafness, cardiac pathology, or the processes of aging. These interests can best be supplied throughout the lifetime of an individual. It is more difficult to do so at the time of disability. For this reason I would consider it a preventive approach rather than a curative one. For the same reason it becomes a sociologic one.

When we consider these wider aspects of

the psychological problem of rehabilitation, it becomes apparent that there will never be enough psychiatrists to care for all of it. In many areas, where the problem is acute, no psychiatrists are available. We have all witnessed the phenomena of ministers, friends, and others helping the disabled through their psychological handicaps. This emphasizes that everyone working with such patients, aware of the problem and of the underlying mechanisms, can help.

The major solution will eventually come through these others, in their roles in preventive psychiatry. In the forefront must be the general physician, practicing his prophylactic psychiatry with families. Next, this same physician, plus the various specialists, must safeguard the patient's psychologic structure with as much care as his metabolic and circulatory balance from the very onset of illness or accident. The general duty nurse must recognize that what she tells and does to the patient may affect his motivation to get well or stay a chronic invalid.

The prevention of psychological damage requires help from many sources. Public health nurses in their instruction of families, public health physicians during their daily contacts in the community, occupational therapists and physical therapists during treatment, vocational advisors in their counselling, social workers in relation to patients and in their help to families—all can contribute to this effort. Any individual who has value to the patient can influence him to recovery, and help prevent the motivation to stay an invalid. This means that all such workers should have a basic psychiatric—or if you will, psychologic—orientation. Some people have this as a "native" ability, many more must learn it. Using this psychiatric orientation unconsciously is less effective than basing it on an awareness of the psychologic forces at play within the individual patient.

Many workers are already aware of this problem and feel helpless before it. They often secure psychiatric consultation only to find it doesn't help them(3). Rehabilitation workers are not getting the assistance from psychiatrists because the rehabilitation worker has insufficient awareness of what

psychiatry has to offer, and, possibly more important, the psychiatrist is unfamiliar with the problems of rehabilitation. Vocational advisors report that they ask psychiatrists for "an evaluation of the patient," and get an evaluation containing only the same information the advisor gave the psychiatrist, but couched in psychiatric language. After all, the advisor simply forwarded his evaluation and the information on which it was based. The psychiatrist is trained to think in terms of personality evaluation, but *not in terms of how do these personality traits relate to rehabilitation problems*. It is this latter the advisor really wants to know. The advisor often presupposes that the psychiatrist is familiar with rehabilitation difficulties, and that the psychiatrist can learn in one interview all the existing motivating factors to stay disabled. This problem will be resolved when the rehabilitation specialist takes time to teach the psychiatrist the problems of rehabilitation; when the psychiatrist teaches the rehabilitation worker what psychiatry can and cannot do; and, after both understand each other, when the rehabilitation worker supplies more pertinent information, and asks more pertinent and specific questions of the psychiatrist.

The answer to the greater problem is an educational one. It will require the active leadership and support of psychiatrists. Workers in the field are aware of their needs

for psychiatric orientation. They feel inadequate because their schools of training fail to tell them these problems exist and fail to prepare them to meet such problems. These workers should make this known to their professional organizations and to their training schools. Psychiatry, however, has its share of responsibility in helping this along. It cannot do so by simply offering its wares. It can have its wares accepted only after psychiatrists learn the problem of their colleagues and then present what psychiatry has to fit the needs of their colleagues as the latter see them. This is true in their associations with the general practitioner, the internist, the surgeon, the nurse, the public health workers, ministers, ancillary therapists, social workers, vocational advisors, and all those concerned in the field of medical rehabilitation.

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INTRAVENOUS METHAMPHETAMINE—ADJUVANT TO PSYCHOTHERAPY¹

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Methamphetamine hydrochloride (Methedrine, B. W. Co.); Pervitin; Desoxyn hydrochloride (Abbott), a sympathomimetic drug, was first investigated as a pressor substance and was incidentally noted to have marked central stimulating properties. Simon and Taube(1) first described the clinical effects on 5 patients with psychiatric disorders and, in this clinical study, called attention to the fact that it made patients more talkative, more communicative, aided release of emotion previously blocked, and was followed by a sense of well being. Levine *et al.*(2) reviewed the history of methamphetamine and reported the psychological and physiological effects they observed in 75 patients. The initial clinical effects of a 20-mgm. dose given intravenously were described as facial pallor, dry mouth, transitory elevation of blood pressure, anorexia, and cold, clammy hands. The short initial period of tension was generally followed by relaxation with increased alertness, elimination of sense of fatigue, and sleeplessness. No significant changes were observed in electrocardiographic and electroencephalographic studies. The psychological effects were noted to be overtalkativeness and relief of tension, and "the recall of emotionally charged material was dramatic." The authors described the drug as helpful in eliciting new data of diagnostic importance from blocked patients, and helpful also in formulating the nexus of active conflicts that were previously undiscovered by ordinary interviews. They concluded that methamphetamine "produces an emotionally charged free flow of material, which may include painful memories, traumatic experiences, intimate personal phantasies, and delusional ideas. Most patients experience a dramatic relief of tension and a feeling of relaxation. Mild depressions are often allayed. The psychologically rich response evoked by Pervitin is helpful both diagnostically and therapeutically."

These promising impressions are confirmed by my personal observations in 66 patients from private practice. The observations extend over a period of more than 2 years. In some instances methamphetamine was used once, in others several times, and in a few cases repeatedly in "methamphetamine interviews."

DOSAGE

The average dose used was 15 to 20 mgms. (about 1 cc.) given intravenously. A higher dose was found to give discomfort, and was of no particular advantage in its psychological effects. Each patient was initially given a smaller test dose of 10 mgms. to detect untoward reactions.

EFFECTS

The immediate reaction is usually a short period of tension, palpitation, and dry mouth. With rare exceptions, there follows a sense of relaxation and marked feeling of confidence and well being. The spontaneous verbalization of a schizophrenic patient is an example: "This is great. My penis feels much longer." There is an increase in the flow of speech, associations, and ideation, accompanied by appropriate emotional responses. There is a sense of being released from the inhibited state. A flood of tears, a burst of rage, or the verbalization of erotic transference emotions often occurs, with a subsequent drop in tension. The effects last over a period of some hours. At no time is there a disturbance in the level of consciousness, and there is no impairment of judgment in the patient's behaviour. This is useful, in that the patient may be permitted to return to work directly after the interview is over. The remote effects are anorexia for the next meal, sleeplessness if the injection is given late in the day, fatigue when the effects wear off, and a slight rebound depression. The most annoying symptom is insomnia, which is easily handled by the use of a night sedative.

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INDICATIONS

Methamphetamine appears to be indicated whenever the patient is severely inhibited or retarded and cannot, by the usual means of persuasion, interpretation, or utilization of transference emotions, be aided in overcoming resistances to verbalization or release of affect. Table 1 shows diagnostic groupings of the 66 Methedrine-treated patients with indications as to the effectiveness of the drug as an adjunct to psychotherapy.

Table 1 Results by Diagnosis

Diagnosis	No. of patients	No. aided
Depression	17	16
Schizoid process	14	11
Anxiety hysteria	16	12
Anxiety state	6	6
Obsessive compulsive	6	2
Hysteria	3	3
"Stuttering"	4	4
Total	66	54

The range of diagnostic groupings indicates that Methedrine can be adjunctive to psychotherapy for a wide variety of reactions. It is, in fact, useful wherever facilitation is desired. Cameron(3) has stated that "a therapy to be successful does not necessarily have to deal with the primary cause, but needs only to be capable of interrupting in a constructive manner an undesirable train of events."

In 17 cases of depression the results were excellent in facilitating therapy. Three of these cases were recurrent depressions, previously treated with electroshock because of their inaccessibility and the acuteness of the clinical picture. With Methedrine, there was symptomatic amelioration, a discharge of hostility-laden verbalization, and the establishment of a psychotherapeutic relationship. Electroshock was obviated. It was strikingly demonstrated that the value of Methedrine alone as a stimulant agent is limited, unless it is utilized as part of a total therapeutic transference relationship. In an experiment, a number of patients were given the injection and immediately sent away. None of them reported any benefit from this procedure. Thus it appears that Methedrine as a simple substitute for other stimulants, such as Amphetamine, has no distinctive value *per se*.

Fourteen patients at various stages of the

schizophrenic process were treated, because of severe habitual blocking at interviews; 11 of these reported marked assistance from the use of Methedrine and they were able to disclose their phantasies and feelings and were definitely aided to a better therapeutic relationship. A number of these patients had repeated injections.

Anxiety hysterics were in the main aided by the utilization of the period of increased confidence to help them face phobic situations once more. Many patients, handicapped by recurrent anxiety attacks in the street or in shops, were able to go from the Methedrine interview to a shopping centre, or fulfill the long-delayed appointment with the dentist.

Methedrine has been of great help in the management of 4 stutterers. One of these patients was so severely blocked that he had never been able to get into a psychotherapeutic relationship. There was a history of previous therapy with drugs, exercise training at accredited speech clinics, direct faradic stimulation ("the wire-brush") and even 20 electroshock treatments in an experimental effort to bring him relief. During his first visits, he was able to get out not more than a half dozen words. With methamphetamine there was tremendous facilitation, and for the first time he has been able to express his feelings during interview and is exploring his psychological problems with marked benefit.

Obsessive-compulsive reactions were little influenced. This is not surprising in view of the structural rigidity of the personality in such cases.

COMPLICATIONS

Severe sudden headache, with vomiting and mild shock, has occurred in 2 cases. Relief was obtained by the immediate use of intravenous sedation. The mechanism is not understood, as it is certainly not yet known what precise changes in cerebral circulation and metabolism are produced by methamphetamine. It is recommended that a small initial dose of 10 mgms. be given the first time in order to forestall such reactions. Two patients who were in a border-line psychotic state became severely disturbed and excited after Methedrine and very nearly ended in hospital before the reaction subsided. The clear emergence of psychotic material has

been commented upon by early investigators. It seems better not to use this drug in doubtful cases unless the patient is in a hospital setting.

Another possible rather than real complication in patients who have received injections at many interviews is habituation. Since the effects are somewhat comparable to those of alcohol in the resulting euphoria, sense of freedom and confidence, patients appear to welcome its usage. In no case, however, has there appeared a problem about discontinuing the drug at interviews, nor have any harmful physiological effects appeared from repeated usage. Shorvon *et al.* (4) report repeated usage in abreactive efforts in patients with skin disorders, but do not further specify the number of treatments given, nor the length of time.

MODE OF ACTION

The mechanism of action is not clearly understood. It would appear that methamphetamine has 2 essential characteristics that determine the clinical effects it can produce. It is a sympathomimetic drug and it is a central stimulant. From clinical observation alone, it appears that the basic effects result from the stimulating properties. An outstanding feature is the sharp accentuation of self-esteem and the increase in confidence without any apparent clinical impairment of judgment. This appears as a definite gain in ego strength, which is associated with the stripping away of the superficial ego defenses, so that the basic neurotic structuring is clarified. With the alteration of the ego defenses, preconscious material, and also previously unconscious memories and affects, can be admitted to the reinforced ego. This process is, of course, a piecemeal affair, but Methedrine appears to speed up the usual rate of progress in psychotherapy, and shortens the period of treatment. The loosening of the inhibited state, the emotional release, and the elevated affect make methamphetamine useful also in the management of the mildly depressed patient (5). In the attempt

to clarify more precisely the mechanism of action of this drug and its effects on personality structure, a series of Rorschach records, prior to and after Methedrine, is being done. Thus far only a small number of patients have had such records in a preliminary evaluation. Tentatively, this confirms the clinical increase in spontaneity and there is a lessening of the use of repression, and less constriction. Further studies of this sort are being carried out (6). At present, one can state that Methedrine has earned a definite place in the therapeutic armamentarium, as a useful adjuvant to psychotherapy.

SUMMARY

1. Methamphetamine hydrochloride, a sympathomimetic drug and a central stimulant, is described as a facilitating agent and adjuvant to psychotherapy.

2. The brief literature is reviewed and the physiological and psychological effects are described, both immediate and remote.

3. Sixty-six patients were treated with Methedrine in office practice, and the results were beneficial in selected cases.

4. Complications were encountered rarely; they consist of headache and the risk of precipitating an acute psychotic reaction.

5. The clinical results are ascribed to the stimulating properties of methamphetamine; the effect is an increase of ego strength and self-esteem, together with the stripping away of superficial ego defenses and the partial dissolution of the resistances.

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THE EFFECT OF CURRENT EDUCATIONAL PROGRAMS ON PERSONALITY DEVELOPMENT¹

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One of the first stubborn facts we confront in examining the effect of current educational programs on personality development is the kind of educational philosophy presented by the school or the teachers. The older conception of education moves forward on the assumption that there is in existence a body of subject matter the mastery of which constitutes an education. Under this concept the educational program, the methods of teaching, teacher attitude, and means of evaluation, all are based on the assumption that knowledge is power. If the pupils learn the facts and acquire the skills as measured by examinations, the teacher judges himself to be successful. He takes no account of the impact of the teaching on the personalities of the pupils. That the effects of such an education on personality development are often bad would be no surprise to a convention of psychiatrists.

The more modern conception of education conceives education to be a process whereby the individual becomes all he is capable of becoming. The teacher accepts the uniqueness of the individual human personality. He looks upon teaching as a process of releasing the creative talents of the individual. Under this concept the learning of practical skills becomes a means to an end and is not seen as an educational end in itself. Under this philosophy of education any knowledge acquired at the expense of personality maladjustment would be viewed as an educational acquisition for which too high a price has been paid.

If we examine our current educational programs we shall find the modern conception far more widespread in the kindergarten, nursery, and lower schools than in the upper grades, high schools, and colleges. Generally speaking, the higher we go on the educational ladder, the more damaging is the effect of

our educational process upon the personalities of the individuals involved. We give the most attention to personality factors in the nursery schools, kindergartens, and in our lower grades and the least in our colleges. In making such a sweeping generalization we must, of course, remember that there are many exceptions to general rules.

I often feel that medical men have difficulty in understanding the reasons for the sharp lag in education between our best knowledge and current practice. In medical practice it is often to the professional and even financial advantage of the practitioner to utilize the latest devices. In teaching, however, it takes a good deal of courage to adopt the newer methods and often the teacher who does will be in serious trouble as a result.

There are several reasons why it is difficult to introduce newer methods in education. The same parent who insists that the doctor must use aureomycin rather than penicillin (or perhaps even some later drug if one is available) will have a feeling that the teacher should maintain a school very much like the one that he attended as a child. We are all in a reminiscent mood with regard to our own education and this is the trickiest of all the moods into which we human beings can fall. The education we enjoyed or suffered as children and young people was not as good as we now think it was. Probably all of us as teachers should be thankful for the fact that this is the way it works out. It does, however, tend to make us conservative with regard to educational practice.

Currently, the situation is more tense than ordinarily. Progressive education, which really started to translate good mental hygiene and personality development principles into educational practice, is currently under widespread attack. I fear that as a result of these attacks we shall be slipping very seriously in our general treatment of children. Here is one place where we need your help very badly.

We witness a very interesting phenomenon in connection with attitudes of parents and

¹ Read at the 108th annual meeting of The American Psychiatric Association, Atlantic City, N. J., May 12-16, 1952.

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public toward teachers and medical men, particularly pediatricians and psychiatrists. If a pediatrician, for example, tells a young mother that she should be kind to her baby and that the child needs love and security, she will follow the advice and think it is good. If, however, an educator advocates that teachers should teach the children with kindness and consideration, he is likely to be thought of as a soft and, even worse, a progressive educator who ought to be carefully watched. I hope that all of you will speak up in defense of what you believe with regard to the treatment of children in schools and communities. During this period we really need your help.

It is, of course, unnecessary in this group to argue that the most important way of bringing about desirable personality development is to maintain good human relationships between teachers and pupils. It is, however, difficult to see how we are going to get these good human relationships if the teacher's own mental hygiene is bad. Here we are forced to consider the effect of our present educational administration upon the personality development of teachers. If I had the time, I could spend a good deal of it on the problems of educational administration and their impact on the personalities of teachers and in turn on teacher-pupil relationship. However, I shall only pinpoint a few of our difficulties.

Concentration of population in large cities and the development of large city school systems have made both community and school relationships more remote. The cement that once held us together at the community level in the little communities is largely lacking. In the big cities the relationships between school administrators and teachers are rather cold and distant, and the teacher is apt to feel

that she is a mere cog in a vast educational machine. I do not see how this difficulty can be overcome unless we can bring about some kind of administrative decentralization in our larger cities. The city of New York, for instance, has about as many teachers as the states of Wisconsin, Iowa, and Minnesota combined. Who would in his right senses think of administering the educational programs of those three states from a single office? Yet that is what we attempt to do in New York. What I have said about New York City applies with almost equal force to Chicago, Philadelphia, Los Angeles, and Detroit. Even the school system of a city of a half-million population is probably too large to be operated from a single office.

One of our great difficulties in education comes from our failure to realize the peculiar character of the educative process. Our profession is, perhaps, the only one in which the practitioner can know all he should know and do everything he should do and yet fail. You can be an authority on the various kinds of knowledges in teaching and yet have a bad impact upon the personalities and their development of the children with whom you come in contact. For in teaching, knowledge is of little value without understanding, skill will avail you little without love, and competence is of slight value without a sincere dedication to human welfare. Our problem in relation to the impact of educational programs on personality development is largely that of equipping a generation of teachers who in addition to professional knowledge and skill have a keen awareness of the uniqueness of human personality, a great faith in children and people generally, a fundamental attitude of search for truth, and a deep love of their fellow men.

GROUP DIFFERENCES IN ELECTROCARDIOGRAPHIC RESPONSE¹

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Potential use of the electrocardiograph for psychological investigation has been obscured by the complexity of the instrument and the intensive technical knowledge required to interpret the pertinent features of the individual curves. The electrocardiograph curve, or QRS complex, has been considered to represent differences of electrical potential and consequent currents in the saline mass constituting the body. Characteristic forms in the complex have been associated with specific functions in the cardiac cycle, e.g., the QR dimension as representative of the relative force of the ventricular contraction of the heart. Cardiographic changes involved in the emotion of fear have been studied by Blatz(1). Hyde and Scalapino(2) were concerned with the influences of music upon electrocardiograms and blood pressure. Landis and Slight(3) observed electrocardiographic characteristics of normal and disturbed subjects. They found less alteration after stimulation in the T-P/P-T ratio in the records of melancholic, postencephalitic, and dementia praecox subjects as contrasted with normal subjects and those with anxiety states.

The present effort was aimed at a statistical examination of the curves of 40 subjects. Sex differences, differences between normal and mentally abnormal subjects, and stimuli differences were evaluated.

METHOD

A series of 10 stimuli, successively rotated, were given to 20 psychotics diagnosed as dementia praecox-paranoid, and to 20 non-psychotic subjects. In each group 10 were men and 10 were women so that there were really 4 groups compared, i.e., the normals vs. the abnormals, the males vs. the females. The average age of the 40 subjects was 34.2

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years. The stimuli were as follows: No. 1: a 30" rest period; Nos. 2-5 were "pleasant" words (demonstrated in the California Adolescent Study(4)); Nos. 6-9 were "indifferent words;" and No. 10 was the sudden crash of a metallic ash tray against the grill of a radiator.

Number one lead on a Sanborn ECG was used, and the subject sat in a chair during the experiment. The stimuli, except No. 1, were given at 10-second intervals, and the signal marker pressed on a 10" stop-watch reading. Except for the psychotics, who were tested together, the records of the normals were gathered over a period of a year.

The records were then quantified in 4 dimensions: (1) rate—as the number of QR peaks in a given time period after the stimulus, (2) amplitude—as the height of the QR, (3) irregularity—a subjective rating of 1 to 3, and (4) on the basis of expert advice, the duration of the S-T segment was included.²

Differences were then sought through the use of the statistical instrument known as the F ratio.³ The normals were compared, in a 2 x 2 table, with abnormals; the males were compared with the females, in the same manner, for each of the 4 measures used. After a significant difference was found in the measure of the S-T segment, the values of the 10 stimuli were broken down into 4 groups: i.e., the "rest" period; the "pleasant" word period; the "indifferent" word period, and the "ash-tray" period. Such a procedure permitted the evaluation of the stimulus areas responsible for the difference.

RESULTS AND DISCUSSION

Of important consideration was the problem of how reliable were the individual records. In other words, what probability was there that the individual curves would consistently reflect the individual differences concerned; or that, tested again, would the individual differences appear as before. To answer the question, the total test items were

² J. J. Sampson, M. D. Personal communication.

³ For a discussion of the F ratio see reference 5.

divided into half and the individual sums for each half were correlated against each other. A product-moment coefficient of .85 was found. Such a value pointed to definite individual differences in the persons tested; and, though below ideal expectations, was on a sufficient level of significance to make further statistical investigation of importance.

Examination of Table 1 indicated that significant differences were to be seen in certain aspects of the cardiac cycle, chiefly in the

comparison was made. It was seen that no significant sex differences were found in 3 of 4 stimulus areas. The "rest period," the "indifferent words," and the area of "pleasant words" failed to elicit significant differences between the sexes in the duration of the S-T segment. However, the sudden crash of a metallic ash tray against the grill of an iron radiator distinguished the sexes on a high level of statistical significance; the females showed considerably more reaction than the

TABLE 1
STATISTICAL ANALYSIS OF DIFFERENCES FOUND IN COMPARING GROUPS

General ECG values		Stimulus area (S-T segments)	
<i>Q.R.S. irregularity</i>	F-value	<i>Rest period</i>	F-value
Normals vs. abnormals	3.30	Normals vs. abnormals	2.97
Males vs. females	0.00	Males vs. females	2.76
<i>Q.R.S. rate</i>		<i>Pleasant words</i>	
Normals vs. abnormals	1.37	Normals vs. abnormals	†7.71
Males vs. females	0.38	Males vs. females	1.20
<i>Q.R.S. amplitude</i>		<i>Indifferent words</i>	
Normals vs. abnormals	0.86	Normals vs. abnormals	0.46
Males vs. females	0.02	Males vs. females	2.85
<i>S-T values</i>		<i>Ash tray falling</i>	
Normals vs. abnormals	*5.02	Normals vs. abnormals	1.56
Males vs. females	2.47	Males vs. females	*4.37

† Significant at the 1% level.

* Significant at the 5% level.

time characteristics of the heart action, whereas other aspects, such as irregularity, rate, and amplitude, were found to be not of as much consequence. "Irregularity" conformed to earlier experimental findings on psychotics; i.e., the psychotics showed less measurable fluctuation to provocative stimuli than the normals.

The S-T segment showed considerably more experimental significance in distinguishing the normals from the abnormals, especially in the area of "pleasant words." The abnormals indicated, as a group, longer S-T segments. Such a finding had no immediate explanation to the writer; yet it seemed that the nonreactivity of the psychotic could be hypothesized as a possible explanation that could be further investigated. The latter hypothesis was strengthened by the fact that no significant difference was found in the responses of the abnormal and the normal groups to the area of the "indifferent" words.

Sex differences were not of primary concern; but, as a matter of interest, the com-

men to this startle stimulus. It was impossible to say whether constitutional or cultural differences were responsible for the differences found. The greater reactivity, as demonstrated by the females, raised the question of whether reactivity, as such, was an adequate differential between the normal and the psychotic.

Future research in the area of electrocardiographic response to emotionally provocative stimuli could utilize the routine ECG findings prior to electroshock therapy in estimating the emotional recovery of the patient. Space for key stimulus areas could be provided with the signal marker at the end of the cardiac examination. Although "pleasant" words seemed appropriate as a key stimulus area, further experimental refinement is in order.

SUMMARY

Group differences between psychotics and normals, males and females, were found in 40 subjects in one area of heart action.

"Pleasant" word stimuli distinguished the psychotics, whereas a startle stimulus distinguished the sexes.

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CULTURAL PROBLEMS ENCOUNTERED IN USE OF THE CORNELL INDEX AMONG OKINAWAN NATIVES

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Despite the fact that Americans have had intermittent contact with the Ryukyu Islands since the time of Commodore Perry, and considerable more since Pearl Harbor, few psychological studies of the people themselves have been made. The Japanese who controlled the islands apparently were not interested, and deemed the Ryukyu islanders "country cousins." Some anthropological and geographical studies are currently in progress, but the only work of much significance now available, other than infrequent periodical articles describing the terrain or berating military ineptness, has been that of James Moloney. No psychological study *per se* had been completed, for Moloney's efforts apparently were confined to personal observations and interpretation. We decided our principal interest and limitation would be to learn the extent of neurosis among Okinawans. It was hoped we might do so in such a way that results could be compared with groups in the United States.

After considering various psychological tests, we selected the Cornell Index (Form N2) because it satisfied a number of the obvious criteria. It was designed as a group test for "the rapid psychiatric and psychosomatic evaluation of large numbers of persons in a variety of situations." That description fit many of the needs, for we ourselves were professional people whose primary responsibility was to the military, and who did not have sufficient time for extensive individual testing. We were interested in testing a relatively large number of people, sufficient to constitute a valid sample of the population. The psychiatric and psychosomatic evaluation was our primary aim, and certainly Okinawa constituted one of the "variety of situations." That we were unsuccessful is no indictment against the Cornell Index, whose validity and reliability are well established, and whose use by the Armed Forces during the war was extensive. No other single

psychological test designed for group dissemination seemed to satisfy the needs of the situation so well. Unfortunately, the cumulative difficulties became so large that even potential validity was destroyed.

The initial and obvious difficulty was one of translation, which we recognized, but did not consider insurmountable. The Okinawan language has never been established as such, and can be written only phonetically. For written communication, the Japanese language is utilized, and it also supplements the Okinawan tongue, particularly for the technical and the more abstruse terms. The test then had to be translated into Japanese, in which nuances of caste are integral but confusing. The Japanese language varies among the larger islands, as it also does when spoken by American Nisei or Hawaiian Japanese. Since the geographic and political affinity to Japan was obvious, the decision to use Japanese as spoken on Honshu, the largest of the Japanese islands, was not difficult. Whether to use a scholarly or a colloquial language approach, whether to write as a pedantic grandfather or as a school chum of equal status, was considerably more so. We compromised on a "journalistic" style, which is relatively impersonal, though friendly. The translation was done and re-evaluated by a number of translators. Kanji printing (with a base of perhaps 1,000 figures) was used, and mimeographing proved no problem.

Since we wished to learn about Okinawa as a whole (Okinawa is the largest, most populous, and most politically significant of the Ryukyuan chain), rather than any one specific group, an adequate sample had to be established. Through the helpful cooperation of the Program and Statistics Section of the Civil Government, this seemed possible, until we began to consider social structure. The Cornell Index is an individual test, but we learned Okinawan people do not ordinarily make individual decisions: they make family ones, to which each individual

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contributes. Even a tactful and understanding Okinawan interviewer would be unable to elucidate individual reactions upon visiting an Okinawan home. Instead, questions would be considered by a cooperative family group, who would discuss at some length the meaning and nuances of the questions, and reach a group decision. The Index is individually, not group oriented, and when faced with a group reaction, loses validity. School-room testing was almost as difficult. In the first place, restricting the test to one group denied the potentiality of a sample for the island as a whole. And too, when separated from his immediate family, the usual Okinawan student replaces the family with his school group, who again could be expected to give a group decision. Though each student in a class of 30 might be given his own blank copy of the Index, a group decision could be anticipated, and we were faced with the possibility of 30 neatly completed questionnaires, all precisely identical. The other obvious restriction of "no talking" was so artificial that results would be similarly dubious.

The length of the Index, which to Americans accustomed to questionnaires is not unduly long, and can commonly be completed within 15 minutes by even those who have not completed grammar school, was to the Okinawans appallingly great. The effort to reach group decisions was potentially so fatiguing, and finally so enervating, that results were questionable.

One of the most curious facets, and one we had not anticipated, was the difficulty that arose because the Index is phrased in question form, the majority of answers being in the negative. To Okinawans, it is impolite to make such answers, for courtesy entails the positive. Since the degree of neurosis on this test is determined by the number of "yes" answers, it became patent that rather than testing the extent of neuroses, we would learn the degree of Oriental courtesy.

Another factor of which we quickly became aware was the extensive use in the test of qualifying adjectives and adverbs. Such words as "ever, frequently, always, completely, slowly, usually, often, entirely" create no undue barrier to the American

mind, but to the more precise (?) Okinawan thinking, these caused much confusion. Of the 100 questions, more than half (we counted 65) are so qualified, and to a degree disqualified for use among the Okinawans.

Many of the individual test questions were inappropriate from the standpoint of different cultures and habits. Nearly all the "stop" questions, designed to screen especially significant disorders (and given special significance in one method of scoring), are ineffective for that purpose among Okinawans. For example, the question, "Do you often drown your sorrows in drink?" loses meaning when one considers that the Okinawan pattern for drinking saki (the native and widely used alcoholic drink) involves the intentional consumption in as brief a time as possible of sufficient saki to become thoroughly drunk. At parties, only the men drink; the women talk among themselves, but drink tea. This was the traditional procedure, now somewhat modified by the contemporary group, following a number of years of direct contact with Americans.

Other "stop" questions, such as "Are you a bed wetter?" are also unusable. Bed-wetting is practically unknown to Okinawans, who begin toilet training only after the child is fully able to cooperate, and for whom the excretory functions sometimes seem a casually social function. "Do you suffer badly from frequent loose bowel movements" loses meaning when one considers the high prevalence of endamebiasis and intestinal parasites among these people, to whom the difficulty is chronic (though an immunity may be partially established) and often untreated. "Did you ever have a nervous breakdown?", "Were you ever a patient in a mental hospital?", or "Has any doctor ever told you that you had ulcers of the stomach?" lose pertinency when one considers that before the war, there was no psychiatrist and no mental hospital on the island; though psychotics are found on Okinawa, the number (among a population of 900,000) can be counted in the hundreds. The mental institution currently has a bed capacity of 80 (there is no outpatient treatment), and houses aments and epileptics as well as psychotics and seniles. Obviously, the incidence is so slight that the connotation

is tremendously different from that existing in the United States, where roughly 4 of every 1,000 persons are hospitalized for mental disease, epilepsy, or mental deficiency.

Not only the stop questions proved inappropriate for this group. Others such as "Do you wish that you always had someone at your side to advise you?" again brought up the different structure of the family, caste, and status. To the Okinawan, to the question "Do you have to do things very slowly in order to be sure you are doing them right?" the socially correct answer would be "Yes," though we construe such an answer as neurotic; to them, it is important to be meticulous, and a job done with infinite care and patience is that well done. "Do you usually feel cheerful and happy?" is difficult to estimate, for though the people on the whole genuinely do seem more gay and less filled with care than Americans, their answer to people outside their family group, and particularly to dominant foreigners, has questionable validity. Similarly, "Do strange people or places make you afraid?" and "Do you get all nervous and shaky when approached by a superior?" must have different connotations to people inculcated in a society sensitively attuned to caste and status. Answers must also be highly conditioned by the unseen presence of the 114,000 Okinawan casualties during the war, whose relatives (those answering the questionnaire) are in many instances financially dependent upon the conquerors. "Do you tremble or feel weak every time some one shouts at you?" may not be a neurotic trait to an Okinawan laborer whose most direct contact with the Voice of America is a shout.

Even climate was found to make a difference in response. "Do you sweat a great deal even in cold weather" means little to the untraveled Okinawan, whose habitat is uncomfortably near the equator. Allied is the question "Are you repeatedly bothered by severe itching?" which has an unduly pertinent weight to the Okinawan, for dermatitis is prevalent among many Oriental and tropic areas, and treatment for even contagious infections is limited.

Economics makes a difference, too. "Is your appetite good?" is somewhat sardonic

at Okinawa, a poor island that needs importations of even rice to supplement a diet limited by quantity as well as diversity. The obese Okinawan is an extreme rarity.

Some of the questions created intriguing problems, and suggested other lines for investigation. "Are you troubled by stuttering?" is a question we had difficulty evaluating. Stuttering and stammering occur, but are apparent to Caucasians only when the Okinawan is under considerable stress; how extensive they may be among Okinawans in general has not been determined, and would be a curious factor to determine. Others such as "Is the opposite sex unpleasant to you?" are difficult to construe because of the different courting customs. Until recent years, "dates" were not known, and marriages were arranged by family intermediaries; even late adolescents enjoyed amusements in groups of their own sex. That there were some premarital sex relationships is confirmed by the prewar attitude toward pregnancy before marriage; this was not condoned, but the child was welcomed. The mother apparently lost little or no status, and her fertility was confirmed, which may have enhanced her value as a fecund wife.

Even such factors as distribution of population caused potential difficulty. More than 50% of all Ryukyus nationals are under the age of 20, compared with a United States grouping of about 33%. Illiteracy among Ryukyans above the age of 15 is 27.73%; in the United States, according to 1947 data, 2.7% of the population who were 14 years of age or over were unable to read and write, either in English or any other language. While these factors would affect the comparison value of any psychological testing, they obviously restrict the meaning of test results, unless properly weighted. We found it a very real problem.

Because the Cornell Index was designed and validated for so very different a group, we found it unusable for the purpose we intended among Okinawans. Perhaps other individual or nonverbal tests would prove helpful learning devices. Certainly variations of block or maze tests would be effective to learn of individual psychological abilities, and the Rorschach might prove useful,

if the language barrier can be encompassed, though much question arises about the basis for standardization among Oriental peoples.

The primary difficulty we found in this attempt at psychological testing was that we did not know enough about the Okinawan or his culture to define what was a neurosis, much less determine the degree of it. Perhaps it may be more feasible to gain greater

socio-anthropological knowledge, and to do test work on an individual basis on more specific traits. To cope with a largely unknown culture, and with the fears and apprehensions (covert and otherwise) of a conquered people, as well as a dual language barrier was more than we (with the limited time available) and the Cornell Index could accomplish.

CLINICAL NOTES

EGO BOUNDARY IN CHILDHOOD AND IN SCHIZOPHRENIA

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Some schizophrenics complain that their mind can be read by other people, who are instantly aware of their thoughts. This is an example of regression to an infantile pattern of thinking.

The child at first does not appreciate that he is an entity distinct from other people, and this is something he must learn with time and experience. This sense of the "boundary of the ego" comes first in respect of the physical self, and only later in respect of the mind. In other words, the child learns first that physically he is distinct from other people, he being one person and his sister quite another, and not till later does he appreciate that his mind too is distinct. Till then he is under the illusion that other people share his thoughts. Following are 2 examples.

The first example comes from my brother, who is 4 years younger than I. The incident cannot be dated precisely, but I think he was about 5 years old. One night we slept in the same bed, and in the morning he led off with the remark, "Max, wasn't that a funny dream *we* dreamt last night?"

When my son was 4 years and 10 months old, he and I were listening to a radio program (a man talking to his children). David was puzzled as to the origin of the voices and asked, "Are those *real* people in the radio?" (The radio was a large cabinet model.) He knew there were no actual persons hidden in the piece of furniture but he couldn't imagine just where they were. I answered that of course there was no one in the radio, but there was a studio where actors produced a play, and their voices were sent out and received in our set. David then asked, "How do the actors know that we've turned the radio on?" Later in the discussion, still puzzled, he remarked, "If they [the actors] were resting when we turned

the radio on, we wouldn't *hear* them." (He meant, When we turn the radio on, how do the actors know they now have an audience and must get back to work?)

This infantile indistinctness of ego boundary is easy to understand. A child pictures the world in terms of his experience. A child in an English-speaking environment is surprised to discover that there are other languages too. In his egocentrism he assumes that his feelings are universal. When he is conscious of the actors in the play, he feels that *they* must therefore be conscious of *him*.

The ostrich is supposed to bury his head in the sand when he wants to go into hiding. This may be legendary as to the ostrich but not as to man, for children believe they are unseen when they close their eyes.

This infantile conception is more than just a source of cute stories about children; it is important in practical adult life too. I know a successful small town rabbi whose habit it is, when he takes his morning walk and passes the home of a parishioner, to wave his cane in greeting even when he cannot see anyone through the window. He thus averts the possibility that the parishioner inside, seeing him pass, will salute him and wonder why the salute isn't returned. With his insight into human nature the rabbi knows that a man sitting in his front room who sees you pass by outside is going to feel that you too see *him*, and if you should give him no sign of recognition he would not easily escape the feeling of having been snubbed.

In schizophrenia there is regression to earlier and more primitive modes of thought. Of the many manifestations of this regression, none is clearer than the mind-reading delusion, wherein the patient feels that he is no longer an independent being and that the thoughts that cross his mind are instantly and automatically known to other people.

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THE USE OF U 500 INSULIN IN DEEP INSULIN COMA¹

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The clinical value of crystalline insulin, in a concentration of 500 units per cc. (U 500), in producing deep insulin coma for the treatment of mentally ill patients, has recently been studied at the Boston Psychopathic Hospital.

The study is based on observations on 42 patients during a 4½-month treatment period in the insulin unit. During this interval, there were 1,385 treatments, with 785 third stage comas (56.9%), which were considered therapeutic in depth. U 500 insulin was used on 123 occasions (8.9%), either alone or combined with another type of regular crystalline insulin. In the other 1,262 treatments, regular crystalline insulin, U 40, U 80, and U 100, was employed. With few exceptions, U 500 was given to patients who required 500 or more units of insulin to produce coma.

RESULTS

1. U 500 insulin was not more successful in achieving therapeutic comas than other forms of insulin. Of the 123 treatments with U 500 insulin, 56 therapeutic comas were obtained (45.5%); of the remaining 1,262 treatments with other types of insulin, 729 comas occurred (57%).

2. The time necessary for the development of the therapeutic coma was not altered by the use of U 500 insulin. Patients reached coma levels in 3 to 4 hours after the injection

of U 500 insulin, as with the conventional insulin concentrations.

3. Delayed or late insulin reactions, *i. e.*, reactions occurring in the afternoon or evening long after recovery from the initial hypoglycemia, were more common in patients who received initially high doses of insulin than in those who received low doses of insulin. For example, out of 69 reactions, 44 or 63.7% occurred in patients who received insulin in dosages from 300 to 800 units; 21 reactions (30.5%) occurred in patients who received dosages from 100 to 300 units; 4 reactions (5.8%) in patients who received dosages ranging from 20 to 100 units.

4. Patients who received large dosages of U 500 insulin likewise were more inclined to develop secondary reactions than patients who received small doses of U 500. All the patients who developed insulin reactions with U 500 received more than 500 units of insulin—the dosages ranging from 500 to 1,600 units. No insulin reactions occurred in the U 500 treated group where the insulin dose was less than 500 units.

SUMMARY

U 500 insulin did not induce therapeutic comas more readily than other conventional concentrations of insulin. The time required for the development of the therapeutic coma was not altered by the use of U 500. Delayed insulin reactions were not more frequent with U 500 insulin than with other types provided the total dosage was equivalent. No untoward clinical effects were noted when U 500 was employed. U 500 insulin can be recommended for deep insulin coma in the treatment of mentally ill patients.

¹ From the Department of Psychiatry, Harvard Medical School and the Boston Psychopathic Hospital.

The Eli Lilly & Company and E. R. Squibb & Sons generously supplied U 500 insulin for experimental purposes.

COMMENT

GROWTH OF THE ASSOCIATION

The present membership of The American Psychiatric Association is 7,125. For the last 4 years the membership has increased by roughly 600 a year. Before that, 300 a year was a maximum figure. The total membership in 1946 was 4,010, so that in 6 years' time there has been an increase of 3,105 members. Not only has the Association shown a tremendous growth in total membership, but there have been a few places that have shown proportionately a much greater increase of membership than others. The membership outside of the United States has increased and many countries that did not have any members at all 10 years ago now have some members. If one takes the 1943-44 membership list prepared in 1943 and compares it with the 1952-53 membership list he has a record of what has happened during the last 9 years. Canada has, of course, been an important and integral part of the Association and a number of our presidents have come from Canada. However, it is worth pointing out that the total membership from Canada at present is only 189, although there has been a slow and steady increase throughout this period. The membership in Canada is scattered throughout the country, but the 2 large cities of Toronto, with 39 members, and Montreal, with 40 members, have about two-fifths of the total membership. Mexico now has 9 members, whereas 9 years ago there were only 2. Central and South America furnish a total of 34 members, while foreign countries, beginning with Australia and ending with Thailand, total 65 members.

The membership of the Association is overwhelmingly in the United States and, although Canada has played such an important role in the Association and its affairs, this is not due to any large number of members. Central and South American and foreign countries have about half the membership of Canada. Actually Canada's membership is only about 2.6% of the total membership of the Association. In the United States the membership at present is largely in propor-

tion to the population of the state itself. It is of interest to take the 15 states with the largest membership and to list their present membership now and 9 years ago:

	1952	1943
1. New York	1,649	577
2. California	712	100
3. Pennsylvania	468	178
4. Massachusetts	377	159
5. Illinois	368	136
6. Ohio	248	83
7. Michigan	247	85
8. Maryland	217	77
9. District of Columbia....	198	47
10. New Jersey	191	52
11. Texas	186	39
12. Connecticut	168	75
13. Virginia	120	42
14. Missouri	119	40
15. Kansas	117	17

From this it will be seen that there are 15 states that have a membership of over 100; 8 states with a membership of over 200; 5 with a membership of over 300; 3 with a membership of over 400; 2 with a membership of 700; and one state with a membership of over 1,600. Looking down this list we see that this is to quite an extent in proportion to the present population of the country, but with a few exceptions. According to the 1950 census the population of the United States was 150,697,361. On this basis New York, with the largest population of any state, has approximately 10% of the total population of the United States, but has approximately 22% of the membership of the American Psychiatric Association. New York State had a population of 14,830,192. California had a population of 10,586,223 or roughly 7% of the total population and 10% of the total membership. Pennsylvania is the third state in population and ranks third in membership. From then on we see a number of exceptions—Massachusetts is fourth in membership, although nowhere near that in population.

The growth in membership during the last 9 years is also of interest. New York State

had the largest total growth of membership, its membership having increased 1,072. California was next in total increase of membership, having increased 612. The greatest percentage of increase is in California, which has jumped from 100 members in 1943 to 712 members in 1952—an increase of over 7 times. Kansas is a close second, having increased in membership from 17 in 1943 to 117 in 1952. New York and Pennsylvania have roughly tripled in size during this period. No states in the top 15, except California and Kansas, have quadrupled their membership, although the District of Columbia and Texas have more than tripled in population. The increase in membership in the United States is, on the whole, a fairly even one throughout the country, with a few notable exceptions in some of the states with very small membership where the figures are less meaningful. It is of interest that Alaska now has no members, as compared to one 9 years ago. Wyoming now has 4 members, whereas it had 6 members 9 years ago.

In the United States we see that there is a very heavy membership population along the Atlantic seaboard, running from Massachusetts down through Virginia. Then there is a second group in the Middle West with a nucleus in Illinois, Michigan, and Ohio. The South generally has a fairly sparse membership, but Virginia, which is also eastern seaboard, is an exception and Texas also is the eleventh of the states in membership. Beyond the so-called midwestern states we find Missouri and Kansas with a small nucleus around them. Colorado has 70 members, but that is almost a part of the Kansas-Missouri grouping. Then there are very few members until one hits the Pacific Coast. In making a trip from California to New York, Denver is a little over a third of the way and Topeka, Kansas is half way, so that geographically Kansas is the center of the United States. The membership of the Association is overwhelmingly in the eastern half of the United States.

All of this may seem rather unimportant, but there are a number of very practical points that are raised by these facts. If one were to say that meetings were to be held where the most members are, New York City would be the logical place for all our meetings. If membership to committees is to be

kept in proportion to membership, then New York State would have 23% of all members of the committees; California 10% and Pennsylvania 6.5%. If one were to figure the permanent home of the Association on the same basis, New York City would be the logical place. One may wish to bring up other arguments. There should perhaps be a certain amount of geographical representation irrespective of population. Canada, for example, has always held proportionately more members of committees, more members of the Council, and has even had more presidents than it is entitled to, purely on the basis of its proportional membership to the Association. Of the members who have served officially on the *AMERICAN JOURNAL OF PSYCHIATRY* since 1844, 3 have been Canadians.

The general membership in Mexico, Central and South America, and in foreign countries raises many further problems. It does not appear likely, however, that within the next 10 years there will be any increase of membership outside the United States that is likely to produce any important shift in the percentage of membership or raise any serious problems.

As regards the meeting of scientific associations, we find a fairly consistent policy on the part of many to vary their meetings regularly and consistently, so that members in the more isolated parts will have some meetings near to them. The American Medical Association every 3 or 4 years holds a meeting on the Pacific Coast, either in San Francisco or Los Angeles. It does the same for Chicago and for Atlantic City. The American Psychiatric Association in its 109 years of existence has held only 2 meetings in the western half of the United States and Canada. A very practical problem arises in the appointment of committees. With the large number of committees in the Association it becomes a very expensive proposition to bring all the members to a single place for a meeting of all committees. As is the present custom, the Council and committees meet in New York every year in November, and if committee membership is in proportion to membership in the different parts of the United States and Canada the expense of bringing committees and Council to this meeting is so great

that the Association itself cannot afford it. One suggestion has been made that certain committees be composed exclusively of easterners, another committee exclusively of mid-westerners, and still another committee of exclusively far westerners. This would enable each committee to meet with a minimum of expense. However, most of those who have considered this matter feel that it is usually unwise to have a committee that is not representative of the total geographical population. At a New York committee meeting it will cost about \$400 to bring a member from the Pacific Coast. It will cost about \$4 for a member living in New York City. In general it may be said that there has always been a great deal of attention paid to having the Council geographically representative of the association. However, it also has fitted in according to the proportion of membership. Of the present 12 members of the Council, 7 live in states bordering the

Atlantic seaboard and 2 live in states bordering the Pacific Ocean.

No one has worked out a solution to this problem and there probably is none. There is a large percentage of the total membership of the Association in close vicinity to New York City. It seems clear, therefore, that the majority of the members can best be served by having committee meetings in New York City. It seems important to point out, however, that both population and membership of the Association has steadily increased in the West. Since the annual meeting this year is being held in California it is worth while reiterating that one member of every 10 of the American Psychiatric Association lives in California and that California has shown a higher percentage of growth than any state that has any considerable membership in the Association.

K. M. B.

FOR A GENERIC CLASSIFICATION OF CERTAIN PSYCHOSES

Under the 2 main headings, manic-depressive and schizophrenic reactions, most clinicians include 4 well-recognized diagnostic entities: "manic-depressive psychosis" ("cyclothymia," "affective psychosis"), "involuntional melancholia," "schizophrenia" ("dementia praecox") and "paranoia." The whole group accounted for 33,345 first admissions to mental hospitals in the United States¹ in 1949; the percentages were approximately as follows: manic-depressive 17, involuntional 13, schizophrenia 67, and paranoia 3. When this total country-wide figure is broken down into states, it is seen that there is a wide variation in diagnoses. In 10 well reported states schizophrenia varies from 46 to 75%. The greatest variation, however, is seen in the diagnosis of involuntional cases. For example, 2 contiguous states diagnosed "involuntional" as 3% (Maine) and 24% (New Hampshire) and "manic-depressive" as 26% (Maine) and 14% (New Hampshire). One doubts if the state line has any biological significance and wonders whether the difference does not lie in the diagnostic criteria of the psychia-

trists! Farrar² pointed this out in 1905, and in 1927 Elkind and Doering³ showed that the variations in diagnosis from hospital to hospital in Massachusetts were so great as to make questionable the significance of the classification as used by staff psychiatrists.

Another explanation may be more constructive: if one takes the point of view that the 4 diagnoses are subdivisions of one large group of related mental disorders, the variations become understandable. If all cases could be plotted on a curve with "pure" manic-depressive at the left and "pure" dementia praecox at the right, I believe that there would be few cases at the extremes and many in the middle. That is to say, there are more cases that show a mixture of manic-depressive and schizophrenic symptoms than there are "pure" cases of either. One explanation could then be that the psychiatrists are not separating different biological phe-

² Farrar, C. B. Dementia praecox in France with some references to the frequency of this diagnosis in America. *Am. J. Insan.*, 52: 257, 1905.

³ Elkind, H. B., and Doering, C. R. Work quoted by Gruenberg, E. M., in *Epidemiology of Mental Disorder*. Milbank Memorial Fund, New York, 1950. (See pages 42 and 43.)

¹ Patients in Mental Institutions, 1949. Federal Security Agency. Public Health Service, National Institute of Mental Health, Washington.

nomena, but are trying to pick points on a curve that represent variable phenomena in one generic type of abnormal human reaction.

A broad description of the group or genus would be that it is composed of persons largely 15 to 65 years of age, who are committed to mental hospitals because of disorders of mood and thought, who have no demonstrable cerebral or somatic lesions. If the disorder is mostly in mood the course tends to be self-limited or cyclic and the cases go to the left of the curve near the rare "pure" mood disorders; if the disorder is mostly in content of thought, it tends to be less cyclic and more likely to lead to progressive deterioration. This puts the case at the right of the curve near "pure" thought disorders. Most cases fall near the middle, but the curve is skewed, because there are more than twice as many admissions for manic-depressive as for schizophrenic disorders.

This concept is not new. Adolf Meyer taught at the bedside in 1917 that the mixed cases were common and the more they showed cyclic mood changes the better was the prognosis and vice versa. He evidently thought of them as related types of reaction.⁴ Another important observation made by many psychiatrists who have watched patients over long periods is that a patient may have a first attack of psychosis that is typically manic or depressive, with no noticeable schizophrenic features, but that in subsequent attacks schizophrenic symptoms appear and subsequently become more prominent, until the patient is permanently hospitalized with a typical deteriorating schizophrenic picture. This clinical impression is substantiated by Elkind's figures.⁵

It not only happens in individual patients that an affective psychosis may gradually change into a schizophrenic, but there is evidence that this may also happen in heredity. Myerson⁶ pointed out that both disorders run in certain families quite strongly and that the general tendency is for a family to begin manic-depressive and after a few gen-

erations end up schizophrenic. Other workers in genetics do not agree to this.⁶

Added to these different pieces of observation that point toward a generic relationship between the 4 disorders are the recent data on mental reactions produced by cortisone and corticotropin (ACTH). Brief psychotic episodes in these patients often run the gamut of the symptoms seen in the whole schizoaffective group. A patient may start with a euphoria, become manic, in a few days give evidence of schizophrenic thinking, become catatonic and later depressed and agitated. Then the cycle may be repeated with variations.⁷

One is impressed with the need of a new sort of nomenclature for psychiatry, in which "disease entities" are less rigid and relationships are emphasized. The concept of genera, species, and subspecies might be used as in other branches of biology. In this framework, one could look upon "manic-depressive," "involutional," "schizophrenic," and "paranoid" reactions as all making up a *genus* composed of 4 species and as many subspecies as the acute clinician deems advisable. But the emphasis should remain on the generic relationship if a useful biological concept is to be maintained.

It is important to have a good generic term for this group. "Schizoaffective" is too awkward and "functional" is indefensible. "Parathymic" is suggested, as combining the ideas of devious thought in "para" and abnormal mood in "thymic." Perhaps it would be better to use the common word "psychosis," but confine it to this genus of disorders. It is already used by many psychiatrists in that way. The broader and (at present) more accurate use of "psychosis" is to denote any patient legally "insane." As used at present, therefore, the term has no medical significance but is a legal classification.

S. C.

⁴ Kallmann, F. J. Genetic Theory of Schizophrenia. Chapter in Kluckhohn, C., and Murray, H. A. Personality in Nature, Society, and Culture. Alfred A. Knopf, New York, 1948.

⁷ Clark, L. D., Bauer, W., and Cobb, S. Preliminary observations on mental disturbances occurring in patients under therapy with cortisone and ACTH. *New Eng. J. Med.*, 246: 205, 1952.

⁴ Lief, A. The Commonsense Psychiatry of Dr. Adolf Meyer. McGraw-Hill Book Company, New York, 1948. (See page 325.)

⁵ Myerson, A. Inheritance of Mental Disease. Williams and Wilkins, Baltimore, 1925.

NEWS AND NOTES

GERMAN PSYCHIATRIC RESEARCH INSTITUTE, MUNICH.—Dr. W. Scholz, acting director of the Max-Planck Institute, in reply to a letter from President Cameron, extends a warm invitation to any members of the American Psychiatric Association when traveling in Europe to visit the Institute, of which Kraepelin was the first director. Dr. Scholz and Dr. Wagner, chief of the clinical department, will welcome the opportunity of giving information and of discussing with American colleagues their scientific and practical problems. Dr. Wagner made a visit to the United States in 1949, and Dr. Scholz mentions his 20 years of personal connection with A.P.A. members doing neuropathological work.

The research program of the Institute is to be reorganized to include neurophysiology, neuropathology, serology, biochemistry, genealogy, and clinical research including psychotherapy.

PROCEEDINGS OF MEXICAN CONGRESS.—The Proceedings of the Fourth International Congress on Mental Health, held in Mexico City, December 1951, have been published in English and Spanish. The English edition is available from the Columbia University Press; the price is \$5.00. Proceeds of the sale of the English edition will be contributed to the World Federation for Mental Health.

THE SETON INSTITUTE, BALTIMORE.—On March 15, 1953, a new constitution and by-laws of the Seton Institute were drawn up establishing a new Executive Coordinating Board, whose present members are Drs. Nicholas L. Ballich, Mary McKinniss Cushing, Jacob E. Finesinger, Manfred S. Guttmacher, Paul V. Lemkau, and the chairman, Dr. Frank J. Otenasek, and secretary, Dr. James S. Whedbee, Jr. Ex officio members are the medical director, clinical director, administrator, director of nurses, and director of social service.

DR. HENRY ALDEN BUNKER.—On March 19, 1953, occurred the death of Dr. Henry A. Bunker at his home in New York

City at the age of 63. He had suffered from a prolonged illness.

Dr. Bunker was a graduate of Harvard University, having received both his A.B. and M.D. degrees from that institution. After interning at Boston City Hospital he served for a period at the Boston Psychopathic Hospital. He enlisted in the army medical corps during World War I and later joined the staff of the New York State Psychiatric Institute on Ward's Island. In 1926 he took up the private practice of psychoanalysis and was later appointed to the teaching staff of the New York Psychoanalytic Institute. From 1933 he was an associate editor of the *Psychoanalytic Quarterly*. He contributed also to the volume, "One Hundred Years of American Psychiatry," commemorating the 100th anniversary of the founding of the American Psychiatric Association. Dr. Bunker had been a Fellow of the Association since 1942. He was also a member of the New York Academy of Medicine.

DR. SAMUEL FEIGIN.—The death of Dr. Samuel Feigin of New York City occurred March 20, 1953, at Palm Beach, Florida. He had suffered a heart attack earlier in the year and had gone south for a period of rest and recuperation. His age was 58.

Dr. Feigin received his medical degree from the New York University College of Medicine in 1920, and had psychiatric training at Bellevue Hospital and Manhattan State Hospital, with further graduate work in neurology at the National Hospital, London. For some years he was assistant professor of psychiatry at the New York University College of Medicine and head of the psychiatric clinic at that institution.

In addition to a large consulting practice Dr. Feigin devoted much time to forensic work. He served as psychiatric consultant and expert for the State of New York in many court cases and had been consultant to the board of education and for the police department of the city. Dr. Feigin was a

Life Fellow of the American Psychiatric Association.

DR. WILLIAM DRAYTON, JR.—At the age of 72, Dr. William Drayton died at the Veterans Hospital, Coatesville, Pa., March 18, 1953, following a long illness. He was a native of Philadelphia and a graduate in medicine from the University of Pennsylvania. He served with Base Hospital No. 10 in France during World War I.

Dr. Drayton was visiting psychiatrist to Philadelphia General Hospital and associate professor of neurology at the Graduate Hospital of the University of Pennsylvania. He was appointed psychiatrist to the Municipal Court in 1926, and as such took part in many trials in which mental health was in question. He was an officer of the Society for the Protection of Children and of the Pennsylvania School for the Deaf. Dr. Drayton was a Fellow of the College of Physicians of Philadelphia and of the Pennsylvania State Psychiatric Society, as well as a member of other professional organizations and clubs.

DR. BALTAZAR CARAVEDO.—News is received from Dr. Caravedo, Jr., of the death of his father, Dr. Baltazar Caravedo of Lima, Peru, on January 14, 1953. Dr. Caravedo had been a Corresponding Member of the American Psychiatric Association since 1945. For many years he held the position of medical director of the Hospital "Victor Larco Herrera," Magdalena del Mar. Dr. J. F. Valega succeeds Dr. Caravedo as medical director.

Dr. Caravedo was responsible for the institution in Peru of reforms in the care of mental patients and also the abolition, in 1917, of the use of all methods of restraint in the treatment of such patients. He founded in 1930 the Liga Peruana de Higiene Mental (Peruvian League of Mental Hygiene). The mental hygiene law in the Republic of Peru is attributable to his initiative.

Two weeks before his death Dr. Caravedo opened the sessions of the Consejo Nacional de Salud Mental (National Council for Mental Health), in his capacity as President, this having been his last activity.

KAHN TEST OF SYMBOL ARRANGEMENT.—A revised and enlarged edition of the Man-

ual for this test is now available. The test is a projective device making use of plastic shapes on the assumption that form preference can be diagnostic of personality dynamics. For information write Major T. C. Kahn, Medical Gr., N.P. Service, Parks A F Base, Calif.

GENERAL SEMANTICS SEMINAR.—The 10th summer seminar-workshop sponsored by the Institute of General Semantics, Lakeville, Conn., will take place August 15-30 at Bard College, Annandale-on-Hudson. The seminar will be conducted by Institute staff and associated co-workers from other institutions and will offer intensive training in the theory and techniques of Alfred Korzybski's nonaristotelian discipline.

COMPREHENSIVE COURSE IN PSYCHOANALYSIS.—On April 24, 1953, the students, faculty members, and alumni of the Comprehensive Course in Psychoanalysis, a graduate program of the department of psychiatry, New York Medical College, celebrated the tenth anniversary of the existence of the course by a dinner-dance at the Croyden Hotel, New York City. The occasion honored Dean J. A. W. Hetrick of the New York Medical College for his "pioneer role in introducing for the first time in the history of medical education a full training course in psychoanalysis into the postgraduate curriculum of a medical school" and Dr. Stephen P. Jewett, professor of psychiatry, for "his foresight in seeing that psychoanalytic training was an integral part of medicine."

Forty-four students are presently enrolled in this 3-year course.

SOUTHERN CALIFORNIA PSYCHIATRIC SOCIETY.—This new Society has been approved by the Executive Committee of the American Psychiatric Association as a district branch of the Association; the application will be further considered by the Council and membership at the annual meeting in Los Angeles. Officers of the Association are as follows: president, Dr. Mathew Ross; president-elect, Dr. Charles W. Tidd; secretary, Dr. Jerome M. Kummer; treasurer, Dr. Leo Rangell. Councillors are as follows: 3-year term, Drs. Allen J. Enelow, Samuel Futterman,

Harry Nierenberg, Jack B. Lomas; 2-year term, Drs. Judd Marmor, Ralph R. Greenson, Eugene Ziskind, Robert E. Wyers; 1-year term, Drs. Eugene Pumpian-Mindlin, Roberta Crutcher, Norman A. Levy, Clarence W. Olsen.

AMERICAN ACADEMY OF CHILD PSYCHIATRY.—At the meeting of the Academy in Cleveland, Ohio, February 22, 1953, the following officers were elected: president, Dr. George E. Gardner; president-elect, Dr. Fred Allen; secretary, Dr. Frank J. Curran; treasurer, Dr. Mabel Ross. Council members are as follows: 3-year term, Drs. Hyman Lippman and Stanislaus Szurek; 2-year term,

Drs. James Cunningham and Cotter Hirshberg; 1-year term, Drs. Edward Liss and Othilda Krug. Dr. Leo Kanner is chairman of the program committee, and plans are under way for a scientific program in Los Angeles on May 4, 1953.

WASHINGTON (D.C.) PSYCHIATRIC SOCIETY.—The following were elected officers at the annual meeting of this Society on March 9: president, Dr. Henry P. Laughlin; president-elect, Dr. Douglas Noble; secretary, Dr. Seymour J. Rosenberg; treasurer, Dr. Marshall D. Ruffin. Dr. Henry A. Davidson and Dr. Mary J. White were named to the Council.

BOOK REVIEWS

CHRONIC DISEASE AND PSYCHOLOGICAL INVALIDISM:
A PSYCHOSOMATIC STUDY. By *Jurgen Ruesch*.
(Berkeley and Los Angeles: University of
California Press, 1951. Price: \$3.50.)

This study attempts to subject to critical scrutiny the fact that people differ markedly in their recovery from the "same" physical pathology, or in their adjustment to the same chronic illness, and it examines some of the psychological, social, cultural, and economic determinants of convalescence. It is well written in a lucid fashion, and it can be read with profit not only by psychiatrists and other physicians, but also by people in such related fields as nursing, social work, and occupational therapy.

Dr. Ruesch and his collaborators turn their attention to those patients who, having had an acute illness, continue to have symptoms after the disappearance of demonstrable clinical and laboratory findings; to those who have failed to come to terms with a chronic illness or defect and are unduly incapacitated; to those who have physical symptomatology without abnormal physical findings. "Complaints and symptoms, however, are in part the result of the individual's deliberate selection and reinforcement of peripheral stimuli. What makes an individual suffer is determined by the manner in which he perceives his real or imaginary disease and not by the magnitude of objective, pathological findings. . . . The focus of interest thus shifts from disease to personality."

The chapter entitled "Social and Cultural Factors in Delayed Recovery" and the conclusions arising therefrom and embodied in the chapter on "Survey and Interpretation of Delayed Recovery" ought to be particularly provocative to psychiatrists, who, although they are aware of psychological aspects, all too often are insufficiently concerned with social and cultural factors as they relate to patients. In this area an attempt is made to deal systematically with data that, while they have frequently led to personal observations and anecdotes, have rarely been treated as important determinants in psychosomatic constellations. It is quite illuminating to find, for example, that the outstanding feature of lower middle class ideology is the importance of conformance, that psychological awareness varies inversely with the need for conformance, and that, in consequence, the middle class person is likely to conclude that feeling bad is indicative of (physical) disease.

Although the prevalent epistemological and therapeutic orientation of the book is that of psychoanalysis, there is a curious preoccupation with conditioned reflex theory. For example, the statements are made that: "The importance of time-linked events in the life of a patient can be clearly understood in the light of the theory of conditioned reflexes. . . . Thus it becomes apparent that psychological experiences may perpetuate physical symptoms, even if the two events have no connection

other than the fact that they occur in the same period of time." Again, in speaking of ambivalence it is stated, "If a boy is told by his father to be aggressive and to fight, while his mother asks him to be submissive and overprotects him, the child is confronted with an unbearable situation. Whichever parent he follows, he is going to offend the other. In his attempt to please both parents he will be unable to make his final choice of whether to be aggressive or to be submissive. These ambiguous childhood situations resemble closely the experimental situations produced in the study of animal neuroses in which inconsistency of conditioned stimuli may lead to the breakdown of an animal." Such an oversimplification ignores such factors as problems of identification, stage of psychosexual development, and the role of the Oedipal situation and the way in which it has been resolved.

In speaking of short-term psychotherapy of individuals with problems of chronic illness, the author states, "In order to have the patient accept psychological treatment, it seems to be wise. . . . to block the use of defense and escape mechanisms. . . ." Such a thesis seems questionable because (1) this approach may lead to an apparent submission on the part of the patient with an attitude that might be expressed—"convinced against my will, I'm of the same opinion still," and (2) it views defenses as undesirable impediments, instead of economically and dynamically important functions of the personality. In fairness to the author it must be stated, however, that a few paragraphs later it is said, ". . . the defense mechanisms of the patient and his conflicts are the subject of discussion."

The group of patients with prolonged periods of convalescence or invalid reactions are said to constitute the bulk of medical practice, and inasmuch as they often receive physical treatment for fundamentally psychological difficulties, and fail to profit therefrom, they constitute an important social problem. Dr. Ruesch stresses the importance of making all practitioners and specialists aware of the socio-psychological aspects in their own field, and recommends the incorporation of departments of socio-psychological medicine in medical schools, and the exposure of students and practitioners to about 6 months of intensive training in this discipline. "The teaching should be revised in such a manner that consideration of psychosomatic aspects becomes as frequent as consideration of surgical intervention." Amen!

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BODY, MIND, AND SUGAR. By *E. M. Abrahamson, M.D., and A. W. Pezet*. (New York: Henry Holt and Company, 1951. Price: \$2.95.)

The object of this book, as outlined in the introduction, is to show that apparently unrelated physi-

cal, emotional, and mental pathological conditions actually have a close relationship and a common background, namely, hyperinsulinism. Most physicians, the authors believe, are not sufficiently familiar with this fact and this would account for errors in diagnosis and treatment that could be avoided. However, in referring to our insufficient knowledge in many a field of medicine, the authors are particularly critical of psychiatrists: "They have invented words and phrases—neurosis, neurasthenia, and psychoneurosis with depression—to hide their ignorance from the layman and from themselves."; "The word psychosomatic, in which the psychic is placed before the physical only for reasons of euphony, is misinterpreted to give the psychic precedence over the physical."

The subject matter of this book comprises the following chapters: "Diabetes"; "Sneezes, Wheezes, Aches, and Pains"; "Alcohol and Alcoholics"; "The Glandular Jazz Band"; "Body, Mind, and Sugar"; and "Hyperinsulinism—Key to Many Doors."

The chapters on diabetes and hyperinsulinism are thorough clinical studies and laboratory investigations of the carbohydrate metabolism. The discussion of alcohol and alcoholics is also replete with pertinent information and stimulating ideas.

The other chapters dealing with somatic manifestations offer refreshing material on the respective subjects.

I wish I could extend my favorable comment to the authors' handling of the psychiatric aspect. Here, I am compelled to state, they show either lack of knowledge or deliberate misuse of what they do know about psychoneuroses and psychoses. As a matter of fact, all their references on the subject appear to have the purpose of showing how ignorant and wrong psychiatrists are in making use of psychological concepts instead of *a priori* attributing any psychosis or neurosis to a physical cause.

To prove their thesis, the authors cite cases in which the psychotic reactions proved to be due to uremia or the psychoneurotic manifestations were caused by hyperinsulinism. Such cases only show that the psychiatrists who handled those patients were careless in not carrying out adequate physical and laboratory examinations. On the other hand, the authors must be familiar with the fact that psychiatric hospitals are equipped with laboratories for clinical pathological studies.

Another point impressing the reviewer is the widespread finding of clinical signs, symptoms, and abnormalities in the blood sugar tolerance test, which leads the authors to conclude that hyperinsulinism is a very frequent cause of psychoneurotic conditions. From my own clinical and laboratory studies of the carbohydrate metabolism in psychotic and psychoneurotic patients, my feeling is that it is the emotional disturbances that provoke disorders in the carbohydrate metabolism, as they cause other somatic reactions.

The book is easily readable and, in parts, quite entertaining with its quips at the expense of psychiatry.

SOLOMON KATZENELBOGEN, M. D.,
Saint Elizabeths Hospital,
Washington, D. C.

CHILDHOOD EXPERIENCE AND PERSONAL DESTINY.

By William V. Silverberg, M. D. (New York: Springer Publishing Co., Inc., 1952. Price: \$4.50.)

The name of the book points to its main thesis that mental illness originates in the adaptations made to traumatic experiences (sexual and otherwise) in the first 6 years of life.

It is based on 30 years' experience in psychiatry and the lessons learned from participation in human relationships of all kinds.

Besides Freud the author leans heavily on Harry Stack Sullivan, who stressed the concept of the human personality as a social product and self-esteem as the nuclear factor in human psychology. However, the author does not refrain from sharp critical evaluation of Freud's theories: "He has left a legacy of confusion and bewilderment in the concept of an ego which must function executively but lacks the wherewithal for this task" (p. 8). He therefore argues that the ego possesses an energy of its own, different from libido, and its main characteristic is striving toward survival and achievement. The ego is thus not merely a defense institution against the id and deserves a more proportionate role in the affairs of the human psyche. This is in accordance with present trend in psychoanalysis.

The stages of libido development described by Freud as oral, anal, phallic, and genital are related to the succession of areas of experience in our western culture and are therefore considered as not necessarily universal. The experiential areas are identified as those of (1) orality and deprivation, (2) discipline (including toilet training), and (3) rivalry and genitality. The author draws on his experience as therapist and teacher to give a lucid portrayal of the effects of the "experiential areas" on the nature of personality and its pathology.

Dr. Silverberg tends to coin new terms. However, he does not get lost in semantics and adheres to his aim to share with his readers his broad concept of mental health and neurosis.

PAUL GOOLKER, M. D.,
New York, N. Y.

PSYCHOANALYSIS AND GROUP BEHAVIOR. By Saul Scheidlinger. (New York: W. W. Norton & Co., 1952. Price: \$3.75.)

In his preface Dr. Scheidlinger states that this volume is to be devoted to an analysis of the contributions to the study of group behavior made by Sigmund Freud. The first half of the book reviews basic concepts of psychoanalysis, first of the individual and later of group phenomena. For the latter he draws largely on Freud's "Group Psychology and the Analysis of the Ego." The author points out that Freud considered this study only exploratory.

The second section of the book, entitled "Implications and Applications," first points out the large gaps in group phenomena that are untouched by the previous material. He points out, however, that workers in sociology and in social psychology, either through lack of knowledge or misunderstanding

ing of psychoanalysis, have failed to take account of the data available from this field. He selects Moreno's "Sociometry" and Lewin's "Field Theories" to illustrate his premise. The conclusion drawn is that much more interchange and integration between psychoanalysis and the social sciences would be useful to both groups. In the last 2 chapters the author calls on his own experience as a group therapist, psychologist, and psychiatric social worker to illustrate the utilization of unconscious mechanisms in the understanding of the group dynamics.

The first half of the book is a concise and clearly written exposition of Freud's contributions to the theory of group behavior. It avoids dealing with controversial material, but by not using data that come from workers in psychoanalysis who have added to or differed with classicism, as well as those whose orientation may have started in anthropology or other social sciences.

In the second half of the book the limitation the author has imposed on himself interferes with an adequate discussion of present-day concepts. By the choice of his illustrative material the author implies that there has been no interchange between psychoanalysts and social scientists.

The book will have real utility for workers in education, group therapy, and group work, as a sound, well-written introduction to psychoanalytic theory.

REX E. BUXTON, M.D.,
Washington, D. C.

THE HEALTH OF THE MIND. By J. R. Rees, M.D.
(New York: W. W. Norton & Co., 1952.)

This newest interpretation of dynamic psychiatry addressed to the lay public is written by Dr. Rees, the director of the World Federation for Mental Health. It is a valuable addition in many ways.

The volume is small and compact, the language is simple and direct, the style terse and readable. The author takes for granted very little knowledge on the part of the reader, but manages not to talk down to him. The table of contents indicates the logical development of material from basic knowledge of body and mind function, their interrelatedness, the dynamic conception of mental illness, on to the problems of the different eras of life. The chapter on "Mental Breakdown" is good, both in its clarity of explanation and the evaluation of different methods of treatment. It seems to this reviewer that the book is the type that psychiatrists might find valuable to answer the many requests for "a good book about psychiatry."

REX E. BUXTON, M.D.,
Washington, D. C.

MEDICAL PROGRESS—1952: THE BRITISH ENCYCLOPAEDIA OF MEDICAL PRACTICE. Edited by Lord Horder. (London: Butterworth & Co., Ltd., 1952.)

This year's volume though slightly smaller than previous issues continues the high standard of the others. As before half the book contains careful

abstracts from "the literature" on subjects from A to Z and if several years of *Medical Progress* are consulted they provide a really useful reference library. The other half contains the "Critical Surveys" of the main branches of medicine and surgery, which are always interesting. These are all carefully written with a view of presenting those opinions and facts that have emerged as sound out of the mass of hypotheses and speculative investigations. In the section of medicine a summary of the action and uses of ACTH and Cortisone is given, and the recent studies on atypical pneumonia are mentioned. Carcinoma of the bronchus, coronary artery disease, and anterior poliomyelitis are discussed. In the surgical section pre- and postoperative care in certain aspects is discussed and the surgery of the sympathetic nervous system and blood vessels is brought up to date. The progress in pathology is of interest because of the emphasis on the biochemical pathology preceding the morphological pathology, which necessarily constituted the older philosophy of pathology. A part of new conceptions and demonstrations is of course the unraveling, little by little, of the explanation of constitutional variation in the face of trauma and infection. Other surveys of rheumatology, blood diseases, antibiotics, nutrition, dermatology, ophthalmology, and industrial medicine are adequately done and emphasize again that these special compartments must never stray far from internal medicine else they lose themselves in a wilderness.

TREVOR OWEN, M.D.,
Toronto, Ont.

RELATION OF PSYCHOLOGICAL TESTS TO PSYCHIATRY. Edited by P. H. Hoch and J. Zubin.
(New York: Grune & Stratton, 1952. Price: \$5.50.)

The subtitle of this book indicates that it records the Proceedings of the Fortieth Annual Meeting of the American Psycho-Pathological Association, held in New York City, June, 1950. It constitutes a progress report on current problems in clinical psychology and presents a many-sided picture and diversity of opinion. Fourteen formal papers by 23 authors are divided into 4 sections: "The Historical Bases for Psychological Tests"; "The Diagnostic Use of Psychological Tests"; "Influence of Exogenous Factors on Psychological Test Procedures"; and "Influence of the Psyche on Psychological Test Performance." The differentiation of topics, however, is by no means so clear-cut. The subject matter of the book can be divided into certain general problems, several of which run through almost all papers, and an assortment of specific investigations that are reported in the latter chapters of the book. The general problems are frequently implied rather than clearly stated but are pretty well shopworn, e.g., the value and place of the clinical psychologist, the comparative value of tests versus clinical experience. In spite of the staleness of the subject, some, but not all, of the discussion is fresh and stimulating. Intelligence tests, which are frequently belittled, have their champions and are shown to be at least valid and rather specific. Pro-

jective tests, which have been so glamorized, are seriously questioned as to validity and reliability, but are shown to be versatile and of great value as clinical stimuli. Rather marked differences of opinion are voiced regarding various tests, but the ones that were of particular interest to the reviewer were the high evaluation of the M.M.P.I. (by one author) and the low evaluation of the various tests for deterioration, including the Wechsler Bellevue scale. The only general conclusion that one can reach is that tests are only the tools of the clinician and that the real measuring instrument is the competent psychologist rather than the test. The inevitable comparison of the clinical interview versus psychological tests comes up again. In one paper, the clinical interview suffers by comparison chiefly because of the very inadequate type of interview rather than the superiority of the Rorschach method. One practical point, which comes out regarding the function of the clinical psychologist, is the opinion expressed by more than one author that a full day or more is necessary for adequate psychological evaluation of the patient.

The practical and experimental papers in the latter part of the book, which include 2 papers on the conditioned reflex, are interesting and provocative.

This book will be disappointing to the reader looking for technical information. It is concerned rather with an evaluation of psychological procedures, and more particularly of psychological tests.

B. H. McNEEL, M. D.,
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DYNAMIC PSYCHIATRY. Edited by *Franz Alexander, M.D., and Helen Ross.* (Chicago: The University of Chicago Press, 1952. Price: \$10.00.)

Rarely do authors attain so harmonious an integration of thinking and feeling as that which 15 distinguished representatives of psychoanalysis, psychiatry, anthropology, and psychology have achieved in this outstanding collection of original papers. The multi-disciplines are clearly and adequately set forth. Owing to their scientific training and breadth of view they are able to bring out the vital relationships and few essential differences in the objectives upon which they are concentrating: the study of man as an individual and his difficulties of adjustment in a complex social group.

The book deals with the concepts of dynamic psychiatry, clinical psychiatry, and the influence of psychoanalysis on allied fields. Franz Alexander contributes the meaningful preface and the brilliant first paper in each of the 3 sections. Although the authors wrote independently, there is a unity of thought that marks an advance in our fundamental concepts and presages the development of more effective techniques in dynamic psychiatry. Alexander says, "The advent of dynamic psychiatry is liquidating the isolated existence of psychoanalysis. As a therapy, psychoanalysis is being reunited with medicine, where it originated. Psychoanalysis is

becoming recognized as a basic science, both in psychiatry and in the social sciences."

Alexander's views of the fundamental concepts of psychoanalysis, the neuroses, behavior disorders, and psychosomatic medicine in themselves constitute an unequalled exposition of dynamic psychiatry. These chapters could be written only by a physician who has mastered the concepts of Freud, then added to them his original thinking, based upon years of experience. In the modern psychosomatic approach to medical problems, Alexander is a leading exponent of the belief that both the physiological and the psychological processes should be studied and evaluated by the same scientific standards. Psychological processes are the function of the central coordinator of the organism, i.e., of the highest integrative centers of the central nervous system, and as such lie in the field of medicine. Since, however, they are perceived subjectively, they must be studied by methods differing from those used in physics, chemistry, anatomy, and physiology. "The creation of an integrated conceptual system which would combine the basic scientific principles of medicine and psychological approaches appears to be one of the most important goals of present day research in psychosomatic medicine."

Brosin writes ably of the contributions of psychiatry to organic cerebral disorders, with the prediction that there will soon be a "productive collaboration."

In "Dreams and Rational Behavior" French gives a clear-cut explanation of the more recent psychodynamic concept of the phenomena of anxiety as mental traumatization, with defensive energies mobilized to check invading stimuli, whether external or endogenous. The roles of ego and superego are convincingly delineated, with stress upon the fact that the superego may assume not only a critical and punitive role, but also one that is supportive and comforting. Strength of endurance and consolation as well as anxiety and consequent repression are derived from the superego.

With particular reference to acute neurotic reactions, but with equal applicability to all neuroses, Saul states that the basis of treatment can be expressed in 3 words—*understand the person*. Accessory methods of treatment, prolonged sleep, electric shock, sodium amytal interviews, group therapy, rest, quiet, and diversion, are often of great help in individual cases. "Fundamentally, however, it is a neurotic reaction which is being treated, and the same basic type of accurate understanding and psychological treatment is required."

Whitehorn's "Psychodynamic Approach to the Study of Psychoses" is written from the standpoint of "comprehensive medicine," of psychiatry as a basic medical science in the sense of psychodynamic understanding of personality functioning. Whether organic or functional, Whitehorn believes that the psychodynamics of the psychosis should be understood and full clinical study of the individual patient should be made that all practical possibilities of correcting or ameliorating any organic factors may be utilized. The higher rate of recovery of psychotic patients in private mental hospitals he at-

tributes to the simultaneous treatment of organic disorders and the application of dynamic-genetic principles of individualized psychotherapy.

It is gratifying that the authors do not merely describe mental illnesses, but devote a large portion of their consideration to treatment. In addition to each author's personal view as expressed in his specific paper, there is a full chapter by Maurice Levine on "Principles of Psychiatric Treatment." He applies to the treatment of mental illness these basic precepts of all medical practice: Treatment should be based on adequate diagnosis; diagnosis should include an understanding of etiological factors; treatment should be individualized, be adapted to and governed by the specific needs of the individual patient.

Relevant physical studies should be made before treatment is begun or during the exploratory period. If the disorder is primarily psychogenic, the therapist can feel confident of his orientation and can stand the pressure of patients to return to the defense of attributing their problems to physical disease.

In a comprehensive chapter, "Emotional Disorders of Childhood," Margaret W. Gerard brings out the need for therapy for the mother to enable her to overcome her own neurotic reactions. There is a pertinent comparison of the neuroses of children and adults and the similarities in the dynamic mechanisms involved in their production. Although brief, the discussions of retention of infantile habits, motor disorders, and conduct problems and their treatment form an excellent treatise that should prove valuable to all therapists who deal with children.

Space prevents individual recognition of each author's contribution except to say that a high standard is maintained throughout the volume. The book is uniformly interesting, thought-provoking, and encouraging as to the future of dynamic psychiatry.

The format is attractive and there are full author and subject indexes. An extensive bibliography of current literature accompanies each chapter, adding greatly to the value of this book and the place it should have in every medical library.

WILLIAM B. TERHUNE, M.D.,
New Canaan, Conn.

UNDERSTANDING CHILDREN'S PLAY. By Ruth E. Hartley, Lawrence K. Frank, and Robert M. Goldenson. (New York, Columbia University Press, 1952. Price: \$3.50.)

This book is primarily addressed to the teaching profession, specifically to nursery school and kindergarten groups. It is the result of a project that was undertaken "to explore the potentialities of play materials and expressive activities both for understanding young children and for providing them with opportunities for discovering and expressing themselves." The project extended over a period of 2 years, in which 180 children, ranging in age from 2 to 6 years, were observed. The authors cover the uses of specific play material: dramatic

play, blocks, water play, clay, use of graphic material, and music and movement. Various play media are described in minute detail, interspersed with illustrative case material recorded in intensive diary form. It probably would have provided more interesting reading, more clarity and usefulness, if there had been less detailed case material to emphasize specific points.

Much criticism has been directed toward educators' failure to recognize the need for individualization and understanding of the total child. The book's especial contribution is that it emphasizes the individual child who brings his total reaction to life and living to the school situation. The authors discuss the therapeutic values in allowing a child to express his normal aggressive drives; also they encourage the teacher to be alert to deviations from the normal. One of the debatable areas is the way the authors far too superficially suggest ways to encourage the child to express his feelings and to reveal his conflicts. Such exploration demands considerable orientation and skills beyond the scope of this book and belongs in the hands of the experts.

There is little value in this material for the psychiatrist and clinical psychologist. It uses established media and concepts in the school setting but contributes nothing new to the field of child development. It may be mentioned that 2 booklets are published in conjunction with the book: "Growing through Play: Experiences of Teddy and Bud" and "New Play Experiences for Children: Planned Play Groups, Miniature Life Toys, and Puppets."

CHARLOTTE H. WASKOWITZ, M.A.,
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S. WEIR MITCHELL AS A PSYCHIATRIC NOVELIST. By David M. Rein, Ph.D. (New York: International Universities Press, Inc., 1952. Price: \$3.50.)

"When somebody, if ever, comes to review my books as a whole, he will probably recognize with astonishment that they include a clinical study of various forms of psychic disorder." Thus wrote Weir Mitchell to Dr. Thayer in 1910. Dr. Mitchell's prospective "somebody" is the author of the present volume.

The book may be regarded as a companion piece to Oberndorf's *The Psychiatric Novels of Oliver Wendell Holmes*, published in 1943. The treatment, however, is quite different. Oberndorf abridged the text of Holmes' 3 novels depicting abnormal personalities, using the author's own words, and supplying running annotations from page to page from the standpoint of psychoanalysis. Rein is not a medical man but a professor of English literature, and this, as Oberndorf expresses it in his sympathetic and informative introduction, is perhaps just as well, as the author "does not feel obligated to hunt for hidden or symbolic implications in Mitchell's numerous novels, but evaluates them on the level at which they were written."

The 2 physician-novelists were contemporary. Mitchell was 20 years Holmes' junior and died

just 20 years after the death of Holmes—both at 85. Holmes was professor of anatomy at Harvard; Mitchell was a pioneer neurologist in Philadelphia. Holmes had given his son, the late Chief Justice of the Supreme Court, to fight with the Union Army in the Civil War; Mitchell, the younger man, had been an army surgeon in that war.

It is interesting to note that in his literary work Mitchell drew upon the writings of Benjamin Rush, fellow Philadelphian who had died only 13 years before Mitchell was born. In his novels, indeed, he introduces the Father of American Psychiatry by name, and in one instance at least recapitulates his study of a case. Rush's work, with which he was thoroughly familiar, undoubtedly played some part in shaping Mitchell's career. The "nervous diseases" in which he specialized included psychiatric as well as neurologic disorders.

But whereas Holmes in each of his 3 psychiatric novels traces the history of one central morbid personality, Mitchell's stories are not so dominated by single case histories but may sketch in a given novel the pathological features of various characters.

Of particular interest is a fictional report based on Mitchell's Civil War experience—*The Case of George Dedlo* (1866). The hero, a young medical man, lost all 4 limbs in their entirety as a result of war wounds. The victim describes with professional accuracy his own symptoms and reactions, psychological and neurological, including the sensations of phantom limbs. Mitchell, who published the story anonymously, could not refrain from giving it a humorous touch in the ending, making use of the occasion at the same time to ridicule spiritualism. George Dedlo attended a spiritualist séance, his missing members paid him a ghostly visit, and he walked on his phantom limbs.

A useful chapter of Dr. Rein's book deals with Mitchell's clinical experience as the foremost American authority of his time on the subject of nervous ailments. Here he gives a number of extracts from case studies that appear in scientific publications. It was material such as this that formed the basis for some of the delineations of personality in the novels Mitchell later wrote.

In evaluating the patient's background and history, and the psychological as well as somatic etiologic factors in his illness, Mitchell was well in advance of most of his contemporaries, but Rein is at some pains to point out his "limitations" on the psychological side. True, his methods bore no relationship to those of Freud; and his biographer Earnest recalls that he drew from the College of Physicians library a Freudian text, after reading which he exclaimed, "Where did this filthy thing come from?" and threw the book in the fire. True also, Mitchell belonged to the nineteenth century when sex was not banded about as in our more biologic and less aesthetic epoch. And if he underestimated rather than overestimated sex factors in relation to many nervous disabilities, may it not be permissible to wonder whether underestimation may be more unfortunate than the overestimation

with which a later generation has not been unacquainted?

In an article published in a medical journal in 1877 Mitchell had written, "The mental attitudes of the nervous man demand of his physician the most careful attention, nor can we afford to disregard anything in his ways of life or his habits of thought and action. . . . The careful student of such cases will find in the individuality of his cases the need for the most minute of such studies, and above all, he will learn that the more fully he commands the confidence of his patients the more can he effect." Mitchell's treatment methods were based upon deep insight and common sense; and since there have been notoriously many ways of treating neuroses, an important ingredient of any therapy being the personality of the therapist, it is understandable that the results of treatment by the great Philadelphia physician compared not unfavorably with those of psychiatrists both before and after him.

Mitchell's first full-length novel, *In War Time*, ran serially in *Atlantic Monthly* (1884) before being published as a book. The author was 55 years old. In this novel he traces in the person of Dr. Wendell the gradual deterioration of a character. It is the old story—a young physician of reasonable promise but of weak, unstable nature, defective ethical sense, carelessness in financial matters, living beyond income, misuse of trust funds, ineffective lying to cover up, finally a craven spirit, broken health, seclusion and opium. This detailed picture of psychological disintegration based on constitutional factors was drawn from life—"a piece of psychology wrought into a production of art," George Meredith called it.

Weir Mitchell probably had as patients more "nervous women who, as a rule, are thin and lack blood," than any other physician of his time. These were the "couch-loving invalids" whose treatment he described in his classic *Fat and Blood* (1877), which went through many editions. Rein gives considerable space to the novels in which these neurotic patients are described with extraordinary clinical precision. The introduction of case histories of this kind was something new in fiction writing. There was Octopia Darnell in *Roland Blake* (1903), Constance Trescot in the novel of that name (1905), Ann Penhallow in *Westways* (1914), the latter being his last novel, published in the year of his death. In a letter (1912) Mitchell had written, "I think I know more about women than most people do; . . . no man knows much about women who has not had under his care a good many sick women. Nothing differentiates the sex as much as sickness." The portrayal of his fictional characters bears out these statements.

One chapter in the book we are discussing deals with several remarkable cases of dual personality; another with cases of dipsomania; and a final chapter in which 3 cases are described under the caption "Insanity"—one an obsessional jealousy with hallucinations in a Swedenborgian, another a paranoid reaction also with conjugal jealousy and persecutory ideas, the third an ill-balanced, impulsive personality of uncontrolled temper who had killed his victo-

rious opponent in a lawsuit, became the victim of pathological fear and overwhelming remorse with hallucinations of the face of the man he had killed, and finally ended his own life.

Mitchell had stated that his special field was all nervous diseases "except such insane as need restraint." The bulk of his psychiatric practice, however, was concerned with a variety of neurotic states, and predominantly among women. He was the first to introduce into fictional literature accurate clinical descriptions of these pathological characters based on his own experience.

Rein's book, which covers the whole range, reminds us that Weir Mitchell's psychiatric novels, written 40 and 50 and 60 years ago, are worth reading or rereading today.

C. B. F.

THE DREAM, MIRROR OF CONSCIENCE. By *Werner Wolff, Ph.D.* (New York: Grune & Stratton, 1952. Price: \$8.50.)

As the author describes it on the title page, this book is "A History of Dream Interpretation from 2000 B.C. and a New Theory of Dream Synthesis." In fact the author goes back beyond 2000 B.C. and reports that "the Sumerian King of Lagash (about 2500 B.C.) built his temple in Ur because of a dream he had."

Wolff's theory of dreams, elaborated in this book, he indicates at the outset: "My interpretation of dreams is based upon a dream *synthesis* instead of a dream *analysis* (according to Freud). The unity in the expressions of our organism, the synthesis which we experience in our perception and in our thinking, the psychosomatic unity which we observe in the findings of modern medicine and psychotherapy, are also assumed to be present in the dream, the language of the unconscious." And further, "According to my basic hypothesis, dreaming and thinking are not completely different in structure but are different only in degree, form of communication, and emphasis of the same thought contents in the waking state. While Freud assumes a dream censor that distorts the dream images so that they do not mean what they picture, splitting thought and expression, it is my opinion that the dream is not a divider but a synthesizer of thoughts. In this dream synthesis reality and imagination, past and present experiences and future expectations fuse into one unit. The dream becomes the expression of the unity of personality."

These quotations suggest the author's approach to his subject. He elaborates further at the end of the book by an interesting comparison of a dream

with a painting. (He points out that many surrealist paintings are dream pictures.) Here he compares the interpretations of Freud, Adler, and Jung with the impressions of the observer of a painting, according to his physical distance from it or according to his "psychological distance" (i.e., his subjective attitude). In this way he accounts for divergencies of interpretation by different observers.

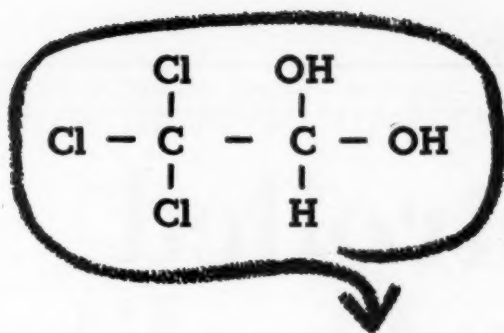
An initial section of the book is devoted to the history of dream theories and methods of interpretation. Beginning with the beliefs of primitive peoples, the author proceeds to outline the role of dreams in the ancient Orient and in Bible narratives; next in Greek and Roman cultures and in medieval times; then in the Age of Reason and the 19th and 20th centuries, the latter dominated of course by Freud and the post-Freudians.

Various types of dream are described from the standpoints of motives and meanings, with many illustrative samples and pictorial illustrations too. (There are some 30 of the latter.) Wolff aligns dream thinking with waking thinking and sees the same operations in both. He calls the dream the "Mirror of Conscience" and conscience he defines as the individual value system set by education, and experience. One further quotation may be given to express his idealization of the dreaming process. "Many problems in our waking life can be solved by mere reasoning, but there are other problems in which a solution proposed by reasoning contradicts a solution proposed by feeling, these cases involve the intervention of conscience. The emotional involvement is based upon needs and drives which compel the individual to act against reasoning, against logic, against practicality, and sometimes against his better interests. There are *physical needs*, . . . *emotional needs*, . . . *social needs*, . . . *value needs*. . . . The dreamer uses his dreaming activity to solve this conflict of needs which conscious reasoning could not solve, because the conflict usually involves antagonism between emotion and reason. Thus a third agency is needed to decide this struggle. This is conscience. And since conscience needs reflection and meditation, usually not offered in waking life, the dream is used to review the thoughts in a play that enacts the conflict. In this dream play the dreamer . . . confronts his thoughts with his values and brings them before the mirror of his conscience."

The book is artistically gotten up and is printed throughout on glazed paper, which brings out to advantage the striking illustrations.

The bibliography contains 338 references.

C. B. F.



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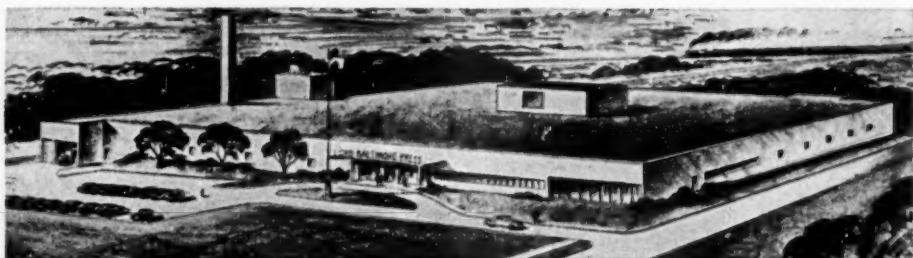
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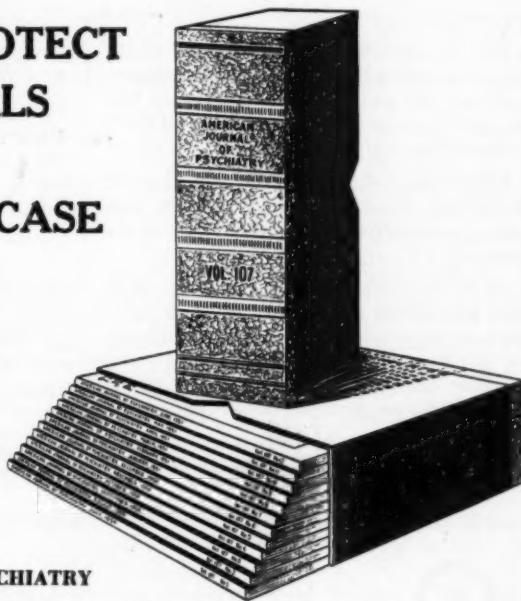
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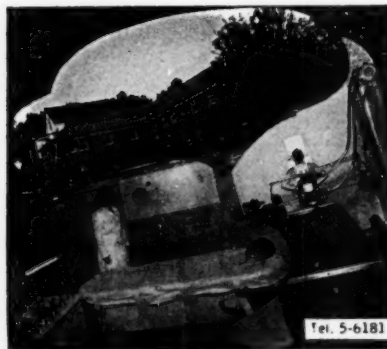
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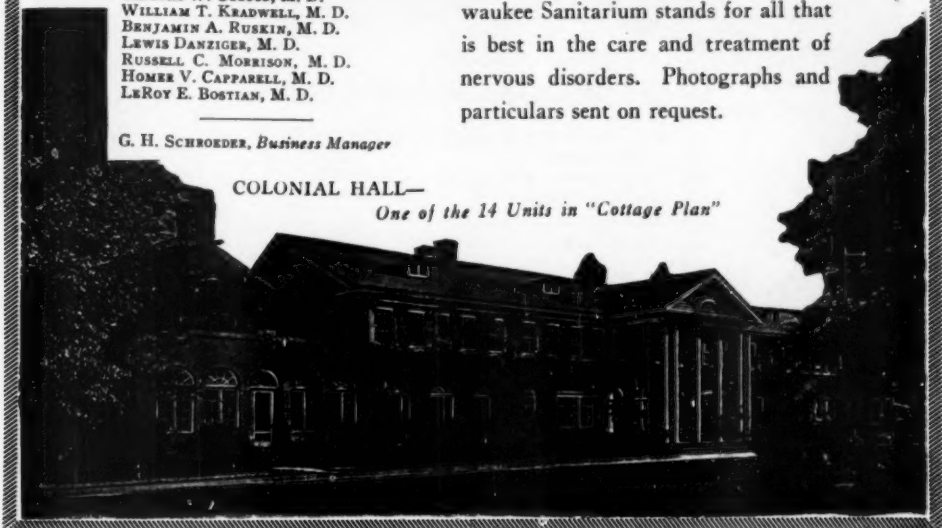
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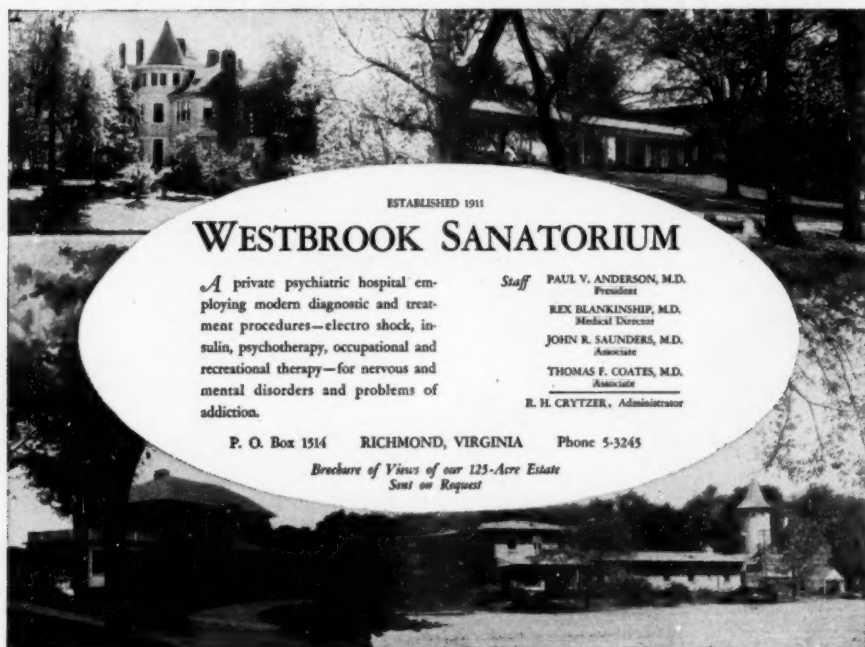
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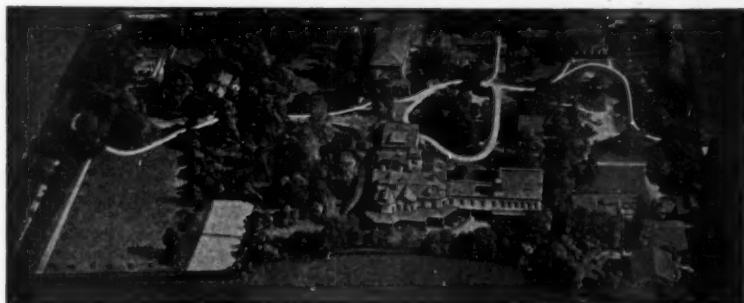
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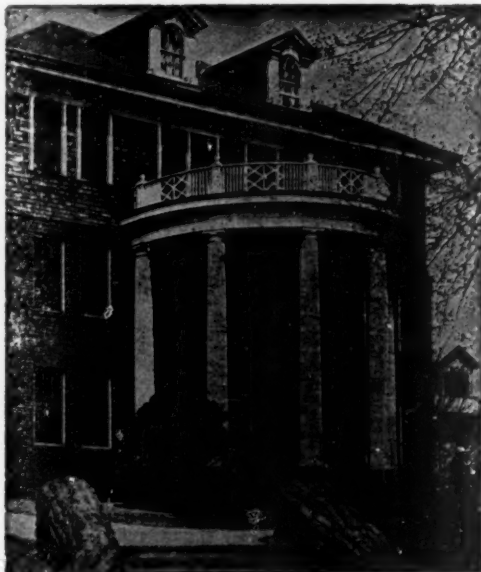
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